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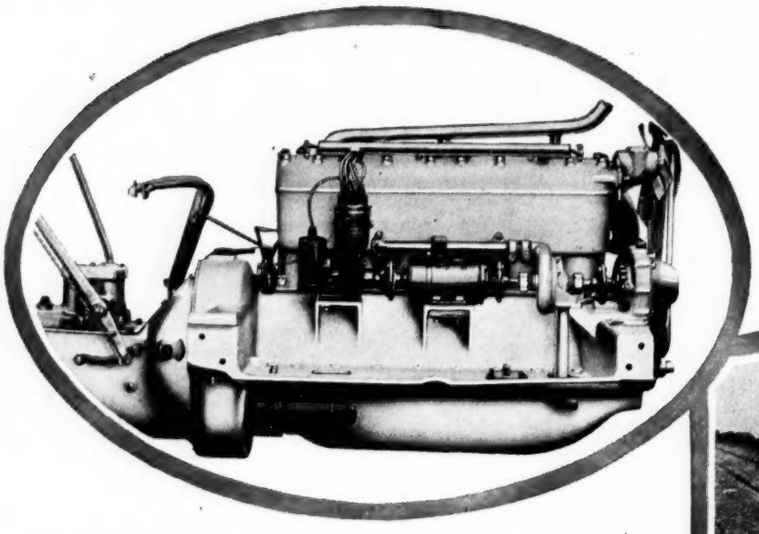

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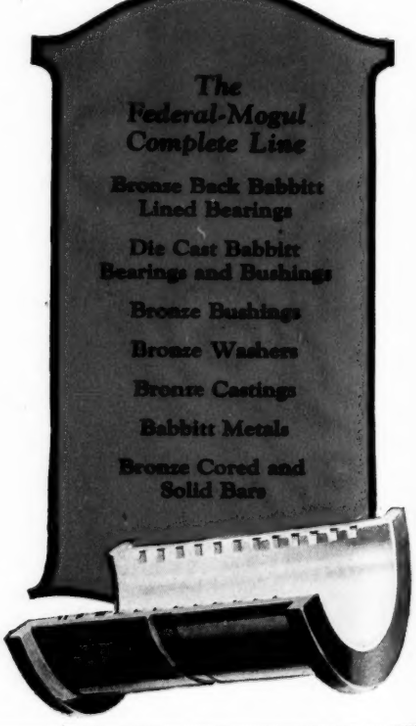

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AUTOMOTIVE INDUSTRIES
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VOL. 51 NEW YORK—THURSDAY, DECEMBER 18, 1924 NO. 25

Another Export Record in 1924! Will We Go Over the Top Again Next Year?

By Norman G. Shidle

FOREIGN sales of American cars and trucks have been greater in 1924 than in any previous year. With detailed figures not yet available, it seems certain that the total of American and Canadian exports and foreign assemblies of American cars will run not less than 375,000 this year. It is possible that it will reach the 400,000 mark. This compares with 328,000 in 1923, which itself was a record year.

With this fine achievement in foreign sales left behind, the industry must turn its attention to next year. Will export business in 1925 continue on the upgrade and result in the establishment of a new high mark for the third successive year?

On the basis of information available at the present moment, a reasonable prediction is that 1925 will see even better results obtained in overseas markets than 1924. In estimating foreign automotive business next year, not nearly so many "ifs" and "ands" are necessary as in discussion of domestic probabilities. While a good year seems likely at home, new sales records are not expected by most executives, although the possibility of major production increases is not entirely discounted.

In the foreign field, however, the scales list heavily on the side of improvement both in volume and profits. Six high lights appear:

1. Many currencies, depreciated materially a year ago, today have reached parity or very close to it. Only in a few instances, notably Japan, are currencies lower than at the end of 1923.

2. Foreign sales are in their period of primary growth, when the rate of expansion can be expected to increase normally because the motor vehicle is finding its place as a means of transportation. This basic impetus to sales is an important factor regardless of business conditions.

3. Generally speaking, however, economic conditions are better throughout the world today than they were twelve months ago.

4. Buses and trucks probably will make important gains during the coming year. Figured on a percentage basis, increased sales in these units probably will be greater than in passenger cars.

5. The registration of motor vehicles throughout the world increased materially this year. Consequently, the market for accessories and equipment has broadened.

6. Greater effort to get foreign business is being made by American producers. This is evidenced by the setting aside of a special "Export Trade Day" at the New York Show this year for the first time.

The greatest increase in car and truck sales ne year seems likely to be Latin America and in c

AMERICAN car and truck sales abroad were greater in 1923 than in any previous year. They totalled about 328,000.

This year the record was broken again; the high mark has been pushed at least to 375,000 and may come close to the 400,000 mark.

Next year looks even better. A recent survey indicates increased business in almost every important market and better economic conditions throughout the world. A few soft spots appear, but they are not numerous enough to be serious.

tain parts of Europe. The working out of the Dawes plan, the German loan and several other factors tend to promote economic stability in Europe to a great extent. While complete business rejuvenation cannot be expected for a long time to come, the situation is much better than it was at this time last year.

The general stabilization of currencies is perhaps the most important single factor in making next year's outlook bright. Sweden, Switzerland, Holland, Venezuela and several smaller countries now have their currencies at or very near to parity, while marked improvement over last year is shown in the currencies of Great Britain, Germany, Poland, Argentina and Uruguay. Other countries in which currency improvement has been shown include Belgium, Spain, Portugal, Greece, Czechoslovakia, Juroslavia, Rumania, India, China, Straits Settlements, Brazil, Chile and Peru.

The Japanese yen has fallen off about 20 per cent.

While reports indicate that Australia, New Zealand, Great Britain and other markets which have accounted for a great bulk of automotive sales in the past will continue to provide an outlet for more units each year, there seems likely to be more effort put on other markets next year than has been customary in the past. Evidences come from various territories that possibilities exist for material increase in automotive business if merchandising guns are concentrated in the proper areas.

A special survey of 1925 export prospects, just completed by the *American Automobile* (Overseas Edition) and *El Automovil Americano,* says in part:

"Brazil seems to be set for a good percentage gain in car and truck registrations next year. The recent revolution apparently has been settled without having done material harm to automotive business.

"Argentina probably will continue the excellent progress made during 1924. Increased prices for cereals and steady advances in cattle prices are only indications of a widespread prosperity there. At the Argentine show, which was held in November, ten makes of American cars were exhibited which never had shown there before.

"One large market in which increased business cannot be predicted with any certainty is India. The best 1925 markets in the Orient seem likely to be the Straits Settlements, Dutch East Indies and the Philippines.

"The outlook in South Africa is much the same as in India. Overstocking took place in South Africa during the middle months of 1924 and only recently has this condition been alleviated materially. Good sales can be expected in South Africa next year, but caution probably will be exhibited by dealers.

"Prospects in Belgium are a bit dark because of the high tariff rates which have been put into effect.

"Denmark has in effect a very high sales tax. If that is removed automobile sales may be quite good."

Germany remains something of an unknown quantity so far as 1925 sales are concerned. The German-American commercial treaty is being held up because of opposition to its shipping clauses.

It is becoming increasingly evident that European competition is getting stronger each year. While American manufacturers still enjoy tremendous advantages in practically every foreign territory, European makers are putting forth strenuous efforts to capture export markets. In the accessory field particularly are the European manufacturers entering the automotive field with some chance of successful competition with American lines. The great predominance of American cars all over the world, however, constitutes an excellent selling basis for the sale of American-made accessories.

That better organized and more serious attention is going to be given in 1925 to export sales of all lines of automotive products is evidenced by the establishment of a special "Export Trade Day" at the New York show this year for the first time.

On this day a conference of accessory and equipment manufacturers will be held at the Bronx Armory to discuss foreign trade. The program for this session has not yet been completed, but the purpose of the gathering will be to foster the extension of export activities among the equipment makers.

Percy Owen, chief automotive division, Bureau of Foreign and Domestic Commerce, will be one of the speakers, while F. J. Kelly Jr., export manager, Electric Storage Battery Co., and George Quisenberry, editor, *The American Automobile* (overseas edition) and of *El Automovil Americano.*

The plan is to make the session lively and practical. The fact that a full day at the big national show is to be devoted to the topic of foreign trade is in itself significant as marking a new recognition of this important branch of automotive merchandising.

Confirmation of the idea that 1925 is going to be an exceptionally good year in automotive export trade is found in the information brought back by various men who have visited foreign fields recently. Typical of these views is that expressed the other day by George E. Willis, export manager, Studebaker Corp., who has just returned from an eight months' tour of the world, who says:

"Improvement in the monetary exchanges of the countries will result in increased business to the American exporter."

The Export Outlook for 1925 *at a Glance*

Favorable Outlook—				Uncertain—
Argentine	Great Britain	New Zealand	Spain	Belgium
Australia	Hawaii	Norway	Straits Settlement	Denmark
Brazil	Holland	Poland	South Africa	Germany
Dutch East Indies	India	Philippines	Uruguay	Russia
Finland	Mexico			

Servo-Mechanisms Perfected So That Slightest Pedal Pressure Slows Car

Made in a variety of types from simple wrapping band brakes to those applied by pressure generated by an oil pump. Particularly useful with four-wheel brakes.

By P. M. Heldt

BRAKES which derive their force of application from the momentum of the moving vehicle (or its tendency to move under the force of gravity) have come to be known as servo brakes. On the other hand, brakes which are applied by air pressure or by a force derived from the torque of an electric motor are known as power brakes. The dividing line between the two classes is not very distinct, and it is somewhat questionable, for instance, whether brakes operated by the vacuum in the inlet manifold of the engine should be classed as power brakes or whether they can be classed as servo brakes. Ordinarily, of course, the vacuum in the inlet manifold is created by power generated in the engine, but the brake is operative also when the ignition is shut off and the clutch is engaged, provided the car is in motion.

A good definition for a servo brake (which term came to us from France) would seem to be:

"A brake applied by a force which either in whole or in part is dependent upon the motion of the car or its tendency to move."

The prototype of the servo brake seems to have been the Lemoine brake, originally conceived as a recoil device for gun mounts, which was introduced on the horse-drawn omnibuses of Paris about half a century ago. This comprised a rope wound a number of times around a drum, secured to the wheel hub at its inner end, one end of the rope fastening to a shoe brake pivoted to the bus body and applying to the steel tire of the wheel, while the other end connected to the operating device. When the operator exerted a pull on this end of the rope, the latter would tighten on the drum and its further end would exert a pull on the brake shoe far greater than the pull exerted by the driver. There was then a braking action not only at the tire of the wheel but also on the drum on the wheel hub.

Hispano Servo Brake

What appears to have been the first real servo brake used on automobiles, the Hispano-Suiza, was based on practically the same principle, the tire brakes being replaced by internal expanding brakes acting on drums on all four wheels. A drum mounted on a power shaft multiplies the pull exerted by the driver through the brake pedal on the leading end of a friction band, the trailing end being connected to a lever on the brake shaft through which the braking force is divided between the four brakes. The lever on the brake shaft thus serves in a sense as the anchorage point for the servo band.

The ratio in which the brake force can be multiplied in this way depends upon the friction coefficient and upon the angular contact between the drum and band. For instance, for a friction coefficient of 0.3 and one complete turn of the band the pull on the trailing end of the band is about 5.5 times as great as that exerted on its leading end. It is thus quite understandable that, as claimed by the Hispano-Suiza company, little more effort is required for applying the brakes than for operating the accelerator.

One disadvantage of such powerful brake-operating mechanism is that it is very easy for the operator to lock the wheels on which the brakes act and that the average operator will frequently do this, although it is very undesirable, because of the destructive effect on the tires. As long as the wheels revolve practically all of the kinetic energy that is lost by the car is dissipated in heat at the brake surfaces, but as soon as locking occurs the dissipation of heat and accompanying wear is transferred to the points of tire contact on the ground. Aside from this, the retarding effect or deceleration is not as great when the road wheels are locked as when they are near the point of locking but still revolving.

It was with the double object in view of reducing the effort required to apply the brakes and at the same time making it impossible to lock the wheels that the French engineer Hallot in 1921 brought out a new brake of quite original design. This brake is used as a transmission brake on Bignan cars. An illustration of this installation is shown in Fig. 2.

The Hallot brake comprises a floating drum *F* which is supported upon a spider or disk *A* keyed to the propeller shaft. In the rim of this disk are formed recesses in which are located the centrifugal weights *C* which, when the car is at rest, are pressed against the inner surface on the floating drum *F* with a constant force by the coiled springs *D*. Near the middle of its length the floating drum is provided with an internal flange which is lodged in a groove formed between the supporting disk *A* and the centering flange *E*.

Also located inside the floating drum *F* are the brake sectors *G* which are provided with a lining *H*. These sectors are expanded by means of the cam *M* mounted on a shaft with a ball-ended lever *N*, from which connection is made to the brake pedal. The camshaft and the brake

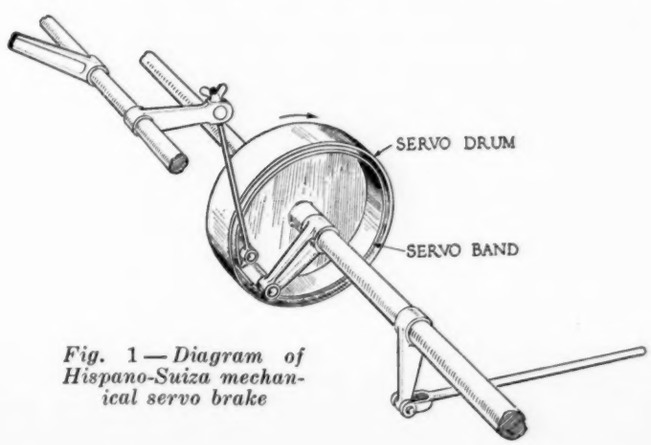


Fig. 1 — Diagram of Hispano-Suiza mechanical servo brake

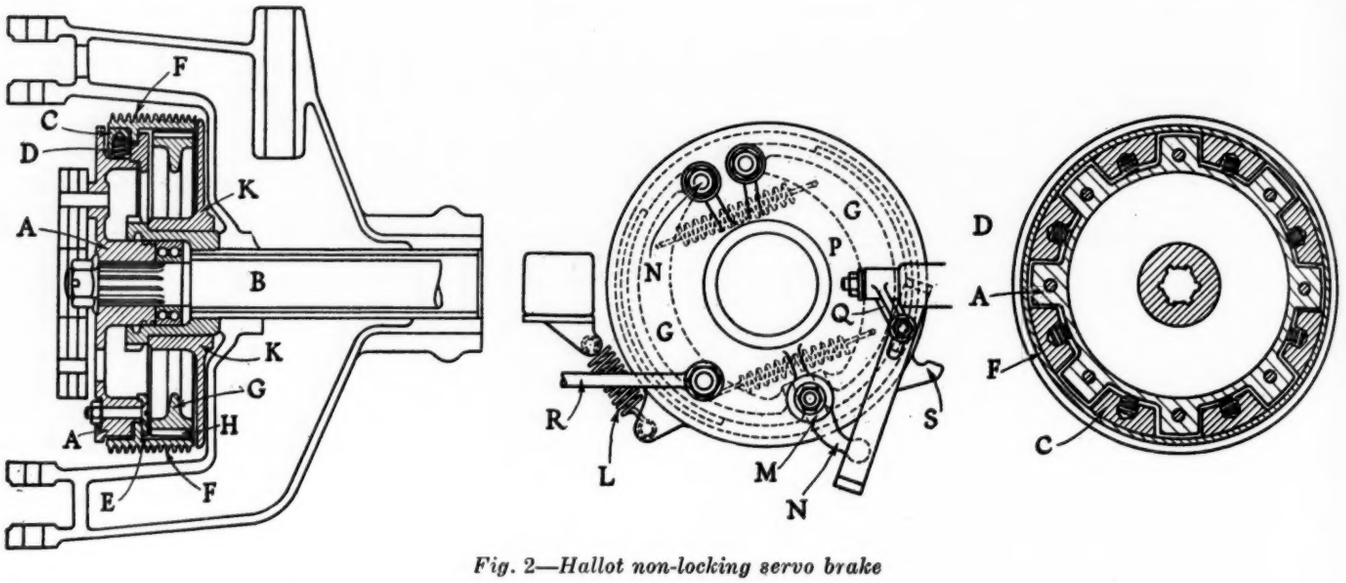


Fig. 2—Hallot non-locking servo brake

anchorages are in a brake supporting disk *K*. This disk is mounted loosely on a collar on the propeller shaft housing, and near its circumference it carries a stud from which a rod *R* extends to the front wheel brakes.

When the car is in motion the floating drum is held solidly on the driving disk *A* by the pressure due to the centrifugal weights *C*. If, now, the brake shoes *G* are applied to the floating drum by means of the cam, there is a tendency for the shoes and the brake supporting disk *K* to be carried along with the brake drum *F*. This will cause the brake rod *R* to apply the front wheel brakes. As soon as the slack in the front wheel braking mechanism has been taken up the disk *K* becomes stationary and the servo mechanism then acts also as a conventional transmission or propeller shaft brake, exerting its braking effect through the rear wheels.

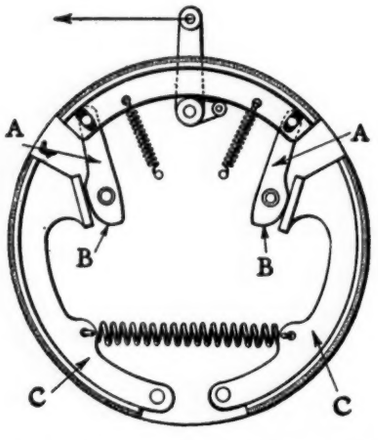


Fig. 3—Renaux double acting servo brake

Should the rear wheels slow down to near the locking point, the centrifugal weights will release the floating drum *F*, and the braking effect on the rear wheels will cease instantly. It will also be plain that in that case the floating drum can no longer exert a drag on the brake shoes and on the brake disk *K*, and the front brakes therefore will also be released. When the brakes are released the wheels begin to turn again, the centrifugal weights will again lock the floating drum to the propeller shaft and the braking action begins anew.

One difficulty with the ordinary friction servo mechanism as represented by the Hispano-Suiza design is that it is effective only for forward motion of the car. If the brake is applied while the car is running backward, so far from multiplying the force of application of the brakes, the servo mechanism will actually reduce it. Of course, practically all cars are fitted with emergency brakes which can be used to check reverse motion; still, it seems desirable that the servo mechanism should operate equally for both directions, for reasons which are obvious and need not be elaborated.

For this reason most of the designs of servo brakes which have appeared quite recently, including the new Renault, the Renaux and the Rolls-Royce, act equally efficiently for both directions of motion. No description of the new Renault servo mechanism has appeared in print so far, and it seems that details are being held back for the present, probably for reasons having to do with the patent situation.

Double-Acting Servo Mechanisms

The problem of the double acting servo mechanism can be stated in very simple terms as follows: Motion of one member to either side of its central or normal position must produce motion of another member always in the same direction. This can be effected by various kinds of mechanism, such as an eccentric, crank or cam, or by means of double pawl and ratchet.

In the Renaux brake there is a third shoe inside the brake drum, which is applied to the drum by means of a bell crank supported by the brake cover plate. This brake shoe is drawn out of contact with the drum when the brake is released by two coiled springs pulling on the shoe in radial directions. When the shoe comes in contact with the drum, since it is not anchored in any way, it will rotate with the drum through a small angle, whereby the levers *A*, *A* are rocked around their pivots. These levers are formed integral with cams or eccentrics *B*, *B* which force the free ends of the brake shoes *C*, *C* against the inner surface of the drum. The form of the cams are such that the shoes *C*, *C* are released when the cams are in the neutral position and are applied to the drum when the cams are moved to either side of this position. Thus the brake has a self-intensifying effect for both directions of motion.

Another double acting servo mechanism has been invented by A. Fortini of Florence, Italy. Referring to the accompanying drawings, which must be regarded as diagrammatic only, the rear axle housing carries a freely mounted disk *A*. Extending downward from the axle housing is a post *B*, to the lower end of which is pivoted a double-armed lever *C* from one end of which a rod *D*

connects to the front wheel brake. Secured to the disk *A* are two brackets *E* and *F*. It will be understood that the double-armed lever *C* when in its normal position extends parallel with the axle housing. When the disk *A* moves around its axis in one direction the bracket *E* pushes against lever *C* between its pivot and the point of attachment of rod *D*, while if the disk turns in the opposite direction the bracket *F* pushes against lever *C* between its fulcrum and its free end, thus tending to cause the lever to turn around its fulcrum in the same direction as in the previous case.

Rotation of the disk *A* is effected by applying the rear wheel brake, which is supported in this disk. It would appear that with this mechanism the braking effect obtained from the rear wheel brakes is only a small fraction of that from the front wheel brakes, because the force of application of the latter will be many times greater than that of the former. This would tend to cause locking of the front wheel brakes, which is highly dangerous, and produces only a comparatively slight braking effect at the rear wheels. Most designers distribute the braking effect in such a way that the rear wheels are braked more energetically, in order to make sure that the front wheel brakes will not be locked under any conditions.

Rolls-Royce Servo Mechanism

A description of the Rolls-Royce servo has just come to hand. It comprises a disk type of frictional device, the same as the original Renault servo. The operation of the device can best be understood from the diagrammatic sketches (reproduced from *The Autocar*) which, however, do not show the exact mechanism employed, but indicate the sequence of the successive operations involved.

The driving disk in the servo is rotated through the bevel gears in the transmission case from the propeller shaft, when the rear wheels revolve, and in direct proportion to the speed of those wheels. The driven disk has upon it two stops which, if pressed hard against the driving disk, will tend to rotate. If it rotates in one direction one stop pulls rod *F*, which is attached to a lever in turn secured by rods through pressure equalizing devices to the cam operating levers of the four sets of brake shoes in drums on the wheel hubs. In reversing, the driving disk rotates in the opposite direction, and the second stop functions through the medium of the rod *R*.

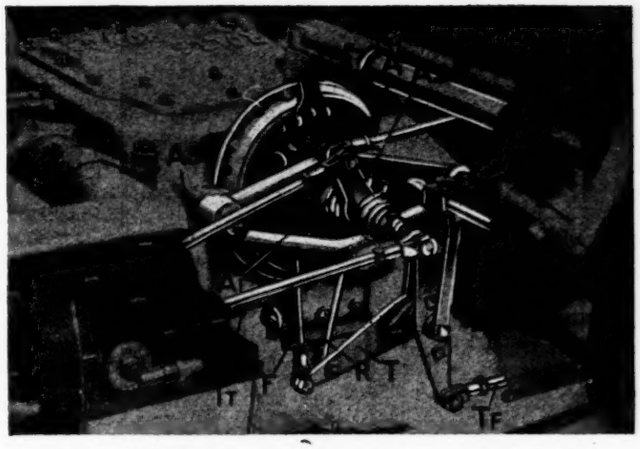


Fig. 4—Rolls-Royce servo motor and its operating mechanism. A, brake pedal rod; A1, servo-operating lever; A2, rear brake operating lever; A3, rear brake operating rod; F, rod from servo actuating T; R, second rod from servo to T; T, lever operating four-wheel brakes; TF, rod to front brakes; TR, rod to rear brakes

The servo motor is brought into operation in a certain sequence, for the pedal is connected by a rod to a lever—A^1 in the photograph—attached to the shaft of the driven disk, which lever is also coupled to a second lever, A^2, by teeth of ratchet shape. The lever A^2 is connected to the rear brake shoes by a rod. When the pedal is depressed the two levers move as one until the rear brakes are applied. Further pressure on the brake pedal then forces the lever A^1 to move still further forward, and the only way in which it can do this is for the ratchet teeth between it and A^2 to move relative to each other. Any movement of the ratchet teeth could only take place if the two levers were to separate. One of them, A^1, is fixed, so it is the other, A^2, which moves to one side, not, of course, sufficiently to disengage the teeth, and in doing so moves the driven disk of the servo motor, to which it is attached, into engagement with the driving disk. Immediately, the servo motor comes into operation as already described, and the brake power is augmented.

It will be noticed at once that there are some interest-

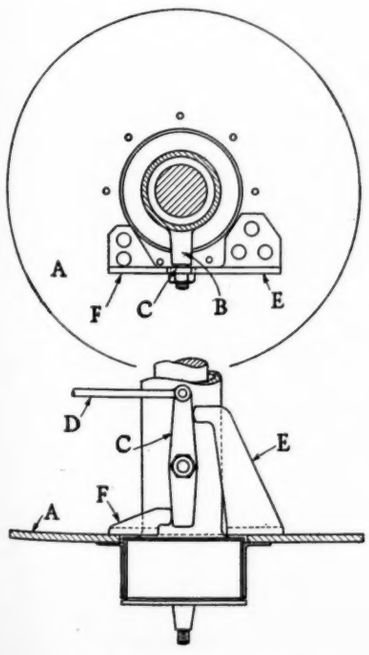
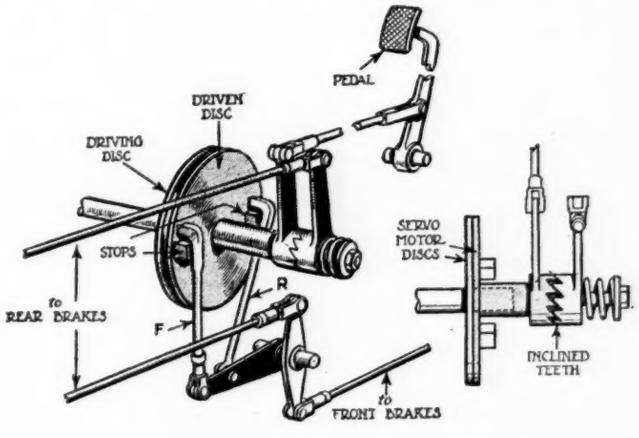


Fig. 4—Diagram of Fortini's double acting servo brake



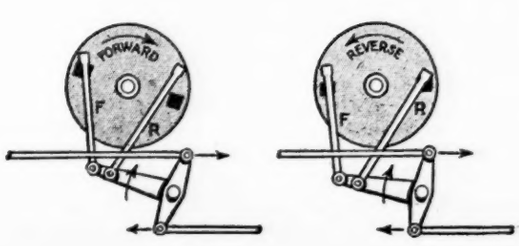


Fig. 5—Diagrammatic sketch of Rolls-Royce servo mechanism

ing features; for example, the rear brake shoes are in contact with the 18 in. drums before the servo motor commences to act. When the servo motor does operate, it applies the smaller front wheel brakes and simultaneously increases the pressure on the rear brakes. The reason for this sequence of operation and for reduced braking power on the front wheels is that it is desired to avoid locking the front wheels, which might prove dangerous. Therefore, the action of the servo motor, which alone controls the pressure on the front wheel brakes, is dependent upon the speed of rotation of the rear wheels. If the latter are locked, the servo motor ceases to operate, and the brake pressure on the front wheels is released, so that steering control is possible.

Under the definition of servo brake given above there is obviously included any band brake in which the wrapping effect is greater than the unwrapping effect; in other words, one in which the point of anchorage of the band is not midway between the ends thereof. In view of the fact that the term "servo" was first applied to brakes combined with a separate device designed to multiply the force of application, it has seemed unwarranted to apply

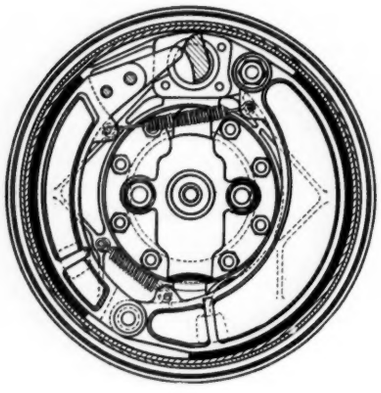


Fig. 7—Perrot two-shoe servo brake

it to brakes that were in use long before the term servo was thought of in this connection, and the term "semi-servo" has been applied to these brakes by some writers.

In brakes with rigid shoes, a wrapping effect is obviously impossible, unless the shoes are made in sections which are linked together. This principle is made use of in the Perrot semi-servo brake (Fig. 7), which has two shoes on the inside of the brake drum, one shoe being anchored on the brake supporting disk and the other pivoted to the free end of the former. The full friction of the floating shoe then serves to apply the shoe to which it is linked more firmly against the brake drum.

A three-shoe servo brake has just been announced by the Perrot Brake Corp. and a drawing of the arrangement is shown in Fig. 8. There are two anchored shoes and one floating one. The floating or primary shoe is pivoted to one of the anchored shoes at *A*, this latter being anchored to the brake support at *B*. Evidently, for forward motion the friction between the drum and the floating shoe helps to apply the anchored shoe to which it is connected. In order to have good brake action also for reverse motion a second anchored shoe, referred to as the auxiliary shoe, is provided, and is anchored to the brake support at *C*. This shoe is applied to the brake drum directly by the cam. The novel point seems to be the overlapping of the two anchored shoes, which have different points of anchorage, so that the three shoes virtually subtend more than 360 deg., although this, of course, does not apply to the actual friction surface. But with shoe brakes the effective friction surface always begins only at some angular distance from the point of anchorage.

A servo brake with one floating and two pivoted shoes

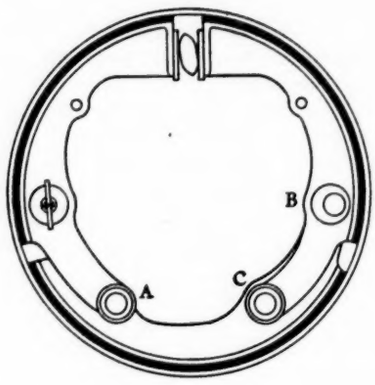


Fig. 8—Perrot three-shoe servo brake

has been announced recently by the Hydraulic Brake Co. of Detroit, and is illustrated in Fig. 6. All of the three shoes subtend the same angle at the center of the drum. The floating shoe, instead of being hinged directly to one of the pivoted shoes, is connected to it by means of a link and lever mechanism, whereby it is aimed to multiply the servo effect. By this mechanism the circumferential frictional pull on the floating shoe is converted into a force having a considerable radial component, which force, moreover, is practically doubled by the leverage effect. One of the two pivoted shoes is not affected by the floating shoe and develops its full braking effect during reverse motion of the car.

Still another design embodying both floating and rigidly anchored friction members inside the same drum has been brought out in France. In this the floating member is located by the side of the regular brake shoes and is so connected to the latter that the circumferential frictional pull on it will be transmitted to the free ends of these shoes.

The term semi-servo brake, which has been used a number of times in this article, has been applied by some writers to all brakes in which a floating frictional member is located inside of and coacts with the same drum as the regular brake shoes. Whether this terminology meets with general sanction remains to be seen.

Hydraulic Servo Mechanisms

Another type of servo mechanism is the hydraulic, in which an oil pump in permanent driving connection with the propeller shaft forces oil into cylinders whose pistons are connected by a linkage to the brakes on the four wheels. Such hydraulic servo mechanisms are being used by Delage, Fiat and Studebaker. The pumps are of the gear type and normally move oil in a closed circuit. When the brakes are to be applied this circuit is interrupted by closing a valve in it, and the oil moved by the pump is then forced into the cylinder provided for applying the brakes, which is connected to the pressure side of the circuit.

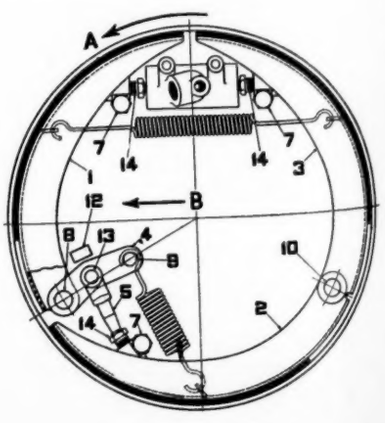


Fig. 9—Lockheed servo brake

Evidently, when the car is running backward, and the pump, therefore, turning in the reverse direction, there is a tendency for the oil to flow through the circuit in the reverse way, and as the oil then cannot get to the operating cylinder the servo mechanism is not effective for rearward motion. This is provided against by so arranging the mechanism that the brakes can be applied by direct mechanical action or by muscular effort unaided.

So far as the braking effect for reverse motion is concerned, there is an important difference between a servo mechanism which is entirely cut out when the car moves backward, so that the driver can apply the brake by muscular effort to full advantage, and one in which there is an unwrapping tendency under these conditions. The braking power for reverse motion should be sufficient to hold the car securely on the steepest grades it is possible to ascend under the power of the engine, but, of course, the effective braking surface need not be very large, as one does not run backward under brake action any great distances.

S. A. E. Formulates Motor Coach Specifications

RECENTLY a special committee of the Society of Automotive Engineers which functions in much the same manner as a division of the Standards Committee has been considering some general recommendations calculated to serve as a basis for regulations relating to motor coaches that may be enacted by State and local authorities. Some tentative specifications of this character also have been under consideration by the New Jersey Board of Public Utility Commissioners, as reported in our issue of Oct. 9, 1924.

This board has been cooperating with the S. A. E. committee referred to. The latest recommendations of the committee, of which George A. Green of the Yellow Coach Mfg. Co. is chairman and on which representatives of most of the prominent bus manufacturers have served, are given below. They are intended to *apply only to single-deck city service type of motor coaches.* These recommendations are scheduled for consideration by the Standards Committee and the Society as a whole at the next annual S. A. E. meeting.

(1) *Body Specification.*—The maximum overall length of body, measured from the rear of the dash to the extreme rear of the body, shall be 24 ft. The maximum body width shall be 8 ft., and the minimum inside clearance height above the floor proper, measured at the longitudinal center line, shall be 6 ft. 2 in. When a ramp construction is used the minimum inside clearance height over the ramp shall be 5 ft. 10 in.

(2) *Window-Guards.*—Suitable protection shall be provided to prevent seated passengers from inadvertently extending their arms or heads through open windows.

(3) *Guard-Rail.*—Motor coaches shall be equipped with suitable guard-rails to prevent passengers from obstructing the view of the driver.

(4) *Width of Door.*—The entrance and exit door of motor coaches shall have a minimum clear width of 24 in.

(5) *Emergency Door.*—Motor coaches shall be provided with an emergency door located either at the rear of the left side or in the center of the back. The door shall have a minimum clear width of 18 in. and extend from the floor to the upper belt panel.

(6) *Panel.*—The construction of the front end of motor coach bodies shall be such as to afford the driver an unobstructed vision to the right and left. The construction of the window at the left of the driver shall be such that it may be readily opened for hand-signaling purposes.

(7) *Handles.*—Rails or grab-handles must be located inside the vestibule and shall be securely fastened.

(8) *Ventilators.*—Motor coaches shall be equipped with ventilators of a suitable type to assure proper ventilation.

(9) *Heating.*—An adequate heating system shall be installed when required.

(10) *Gasoline Tanks.*—When the gasoline tank is installed inside of the body, it shall be filled and vented from the outside of the body and shall be completely inclosed inside the body to separate it from the passenger space.

(11) *Mirrors.*—All motor coaches shall be provided with an inside and an outside mirror.

(12) *Foot-Boards.*—The front foot-boards shall be constructed of fireproof material.

(13) *Fire Extinguisher.*—All motor coaches shall be equipped with at least one fire extinguisher, which shall be maintained in proper condition and exposed to view at all times.

(14) *Inside Lights.*—The interior lighting shall be at least 5 rated cp. per seat passenger capacity.

(15) *Wiring.*—The minimum size of wire from the battery and the generator to the point of lighting distribution shall be No. 8 A.w.g. stranded. For the interior distribution system of lighting, two lamp circuits in parallel are recommended, for which the minimum size of wire shall be No. 12 A.w.g. stranded, or the equivalent. When more than two lamp circuits are used, the minimum wire size shall be No. 14 A.w.g. stranded, or the equivalent. All terminal connections shall be soldered and all splices shall be soldered and taped.

(16) *Switch.*—All motor coaches shall be equipped with a switch of ample capacity.

(17) *Stop Signal System.*—Suitable signaling devices shall be installed within easy reach of all passengers.

(18) *Stop-Lights.*—All motor coaches shall be equipped with a stop-light.

(19) *Destination and Route Signs.*—A route sign shall be located over the windshield on all motor coaches and so placed and illuminated that it may be read day or night from at least 100 ft. ahead of the vehicle. It must not interfere with the driver's vision or produce an annoying glare.

(20) *Overhang of Body.*—The maximum rear overhang of the motor coach body beyond the center line of the rear axle shall be 7/24 of the overall length of the chassis.

(21) *Height of Chassis Frame.*—The maximum height of the frame, measured from the ground level to the top of the frame, without pay-load, shall be 35 in.

(22) *Bumper.*—The rear bumper shall extend at least 4 in. beyond the rearmost point of the body and shall be attached to the chassis frame.

(23) *Brakes.*—All motor coaches shall be equipped with not less than two sets of brakes, one operated by a hand lever and the other by a pedal. Each set of brakes shall be capable of holding the vehicle when it is fully loaded and on a 15 per cent grade.

(24) *Wheel Housing.*—The construction of rear wheel housings shall be such that no damage can result from bursting tires. The construction of the fenders shall be such that no undue accumulation of dirt or foreign matter can be deposited on the body.

(25) *Exhaust.*—The exhaust pipe shall extend to the extreme rear of the vehicle. The rear windows in the body shall be fixed, to keep out exhaust gas.

One-Third Down Payment to Be Required on Future Time Sales

Members of newly formed National Association of Finance Companies pledge themselves to make owners complete payment on cars in 12 months. Bankers behind movement.

ORGANIZATION of the National Association of Finance Companies at a meeting held in Chicago Dec. 8-12 marks the culmination of efforts originated several months ago by the largest banking interests in this country to strengthen the financing of automobile sales, and probably is the beginning of definite improvement in handling of retail automobile paper throughout the country.

One of the first actions of the new association was to adopt a resolution urging that "on monthly instalment payments covering new passenger cars the minimum down payment by purchasers shall not be less than one-third of the cash or 30 per cent of the time selling price at point of delivery, including accessories and equipment."

The significance of agreement on this resolution alone is apparent when it is realized that much longer terms have become common in many places and that determined efforts to follow the principles laid down in the resolution were pledged by representatives of 400 financing companies, including both those who do business on a recourse and a non-recourse basis. The companies endorsing the resolution represent 90 per cent of the country's total capitalization in this business. A. E. Brooker, Securities Investment Co., St. Louis, has been elected president of the new association.

Resolutions Which Received Endorsement

Two other important resolutions which received endorsement from this group of finance company representatives were:

1. "On monthly instalment paper covering new passenger cars, the maximum maturity of such paper shall not exceed twelve months, payable in equal monthly instalments."
2. "On monthly instalment paper covering used passenger cars, the minimum down payment by purchasers shall not be less than either 40 per cent of the cash or 37 per cent of the time selling price at point of delivery, including accessories and equipment, with a maximum maturity of twelve months, payable in equal monthly instalments."

The new national organization of automobile finance companies resulted directly from a gathering of representatives of banking, automobile manufacturing and finance company interests which was brought together in Chicago, primarily as the result of informal conferences among bankers during the last three months. These informal conferences began at the instigation of A. W. Newton, vice-president of the First National Bank of Chicago, and were carried on, it is understood, because banking interests wish to safeguard automobile paper which, *properly handled,* they believe to be the best with which they deal.

It was with the idea of eliminating from the automobile financing situation certain evils which threatened to lower the value of automobile paper in general that the Chicago conference was called. Its success exceeded the expectations even of those who had hoped most for it. While all of the problems of automobile financing were not solved, by any means, very definite strides were taken toward eliminating the chief troubles which are present today.

The meeting of these interests, resulting in the formation of a national organization of finance companies, has served to bring together in a permanent way various conflicting interests and to provide an orderly means of discussing future difficulties and of increasing the stability of the retail financing.

Recourse and Non-Recourse Methods

A definite attempt was made at the meeting, both before and after organization of the national association, to avoid discussion of the relative merits of the recourse and non-recourse methods of retail financing. Arguments on this topic did arise in the conference on more than one occasion, but success was achieved in keeping it from becoming a major subject for consideration at this time. The subject, however, was referred to a special committee for free consideration in the near future.

The value of the resolutions passed will be apparent to most of those familiar with the basic needs of sound merchandising practice in the automobile field. The thought behind the whole procedure was that of making financing of retail automobile sales permanently sound, through elimination of methods which, although temporarily advantageous to individuals, would certainly work harm to the industry as a whole in the long run.

A strong belief exists in banking circles, it is said, that production schedules maintained at a high point on the basis of cars being sold at retail on uncertain credit terms cannot permanently benefit even the manufacturers whose overhead has been reduced temporarily by such methods. It is not believed that any considerable volume of sales have been produced on this basis up to the present, but bankers are eager to eliminate the danger of any such condition arising in the future.

At Least One-third Down

The recommendation urging at least one-third down payment was discussed at length by the unorganized assembly on the first day of the meeting and was held over until the second day for final disposition with the hope that one financing company, not committed to the resolution, might be won over to its provisions. When the resolution came before the organized session for approval, this company announced that not only would it live up to the provisions of the resolution in question but that it would support the entire association program on the points of limiting credit to twelve months and a minimum down payment of one-third of the retail delivery price.

No attempt was made to deal with truck and taxicab financing at this first meeting. Such financing involves only about 15 per cent of the total business, and for this

reason it was decided to postpone consideration of it until later. This idea was embodied in the following resolution, also approved unanimously:

> "Inasmuch as the total volume of taxicab and truck business is comparatively small, the Committees of Finance Companies and Bankers have not attempted to make any suggestions at this time as to terms of payment on taxicabs or trucks of any description. This does not imply that any smaller down payment or longer terms of payment should be recommended than in the case of passenger cars."

Dealer Endorsement on Used Car Sales

A late hour effort was made to amend the resolution governing used car sales by requiring the dealers endorsement on all used car paper. The proposal threatened to reopen the argument on recourse and non-recourse which several times nearly disrupted proceedings, but it was passed over diplomatically by a resolution which provides for a mail vote later on this question.

Supervising the referendum will be a committee of three bankers, three representatives of non-recourse companies and three representatives of recourse companies. With the adoption of the down payment resolution, the original program as recommended by bankers went through.

Alfred H. Swayne, representing the N. A. C. C., who had been on the platform constantly up to this time, made a short talk as he was about to leave, in which he expressed his pleasure over the association's accomplishment and renewed his assurances that, while he could not speak for all manufacturers, he was confident that such a constructive program would have the hearty support of the car manufacturers. He stated that he regarded the movement as one of great importance to the stabilization of credit in the automobile retail field.

Much significance also attaches to the statement presented to the association by the National Automobile Dealers' Association through Vice-President C. E. Gambill. Mr. Gambill called attention to some principles on the subject of automobile crediting which were enunciated by the N. A. D. A. some time ago and which in substance are nearly identical with the principles approved by the finance committee. The N. A. D. A. position is as follows:

1. In new passenger automobile financing, a minimum down payment of not less than one-third of the retail delivery price.
2. Balance in equal periodic notes of not more than twelve months' duration.
3. In used passenger car financing a minimum down payment of not less than 40 per cent of the purchase price.
4. Balance in equal periodic notes, preferably in eight months and not longer than twelve months' duration.

Easier Terms Unsound

Mr. Gambill asserted that a recent tendency to lower the down payment to less than one-third of the total retail delivery price and to grant time extensions for longer than twelve months in the belief of the N. A. D. A. is unsound and is capable of leading to disaster in the trade.

Following is a list of the officers elected by the National Association of Finance Companies: President, A. E. Brooker, Securities Investment Co., St. Louis; first vice-president, John L. Little, National Bond and Investment Co., Chicago; second vice-president, J. J. A. Fortier, Equitable Credit Co., New Orleans; fourth vice-president, L. F. Weaver of L. F. Weaver Co., San Francisco; secretary and treasurer pro tem, W. G. Tennant, Tennant Finance Corp., Chicago. Headquarters will be established in Chicago.

Directors at large: Henry Ittleson, New York; C. E. Vesy, Omaha; John L. Little, Chicago; E. M. Morris, South Bend; J. J. Schurman, Jr., New York; G. A. Piviotti, Pittsburgh; A. E. Duncan, Baltimore; R. D. Ewing, Toledo; J. J. A. Fortier, New Orleans; O. Ray Rule, San Francisco; A. E. Brooker, St. Louis, and L. N. Sevier, Philadelphia.

Directors from Federal Reserve districts: First, Timothy L. Byrnes, Boston; second, David B. Costello, Syracuse; third, G. B. Squires, Philadelphia; fourth, A. A. Ross, Pittsburgh; fifth, F. R. Williams, Baltimore; sixth, Glenn B. Hyman, Atlanta; seventh, A. E. Holton, Detroit; eighth, E. W. Carter, Louisville; ninth, L. N. Rocheford, Minneapolis; tenth, R. C. Kemper, Kansas City; eleventh, William Ratcliffe, San Antonio; twelfth, L. F. Weaver, San Francisco.

E. M. Morris, who is head of the Associates Investment Co., South Bend, was chairman of the meeting.

Favor Tilting Lamps 3 Degrees

ACCORDING to a report issued by the Standards Department of the Society of Automotive Engineers, observations made by the Motor Vehicle Lighting Committee of the Illuminating Engineering Society, using a car prepared for the purpose by the National Lamp Works, indicated that headlamps tilted downward three degrees result only in momentary glare when passing over the crest of a hill, whereas the glare produced by lamps tilted only two degrees still was troublesome. The same was true in the case of tests made with cars passing in opposite directions at dangerous points, even when rough road conditions were simulated by jouncing the car.

Other tests intended to determine the effect of deep and shallow road illumination with a three-degree tilt showed that no real difference was noticeable with these two types of illumination. A fair degree of security seemed to be possible even at speeds as high as 40 m.p.h.

At a meeting held prior to the tests, A. W. Devine, illuminating engineer of the Commonwealth of Massachusetts, who has been retained temporarily by the State of New York to organize its Division of Headlamp Inspection, stated that an inspection of the headlamps on 162 cars recently stopped near Albany gave the following results:

	Per Cent
Satisfactory	7
Without an approved device	17
With twisted lens	13
With defective reflectors	39
Out of focus	80
Glaring	78
Insufficient light sources	20

Figures recently given out by the National Automobile Chamber of Commerce indicate that during the first nine months of this year 27 fatalities have resulted because of too strong lights on vehicles and 14 to confusion in dimming.

A NATIONAL school of petroleum and liquid combustibles has been established at the University of Strasbourg. It will deal with the geology, the exploitation and the chemistry of petroleum and will gradually take the place of the present Petroleum Institute, whose scope of activities will thus be materially enlarged. A site for the new buildings required has been donated by the City of Strasbourg, while funds for the establishment of the school have been contributed by the French Government and by various industrial organizations in Alsace.

Truck and Bus Operators Shake Hands with Railway Men

Each gets a better idea of the other's point of view at New England Motor Transport Conference and both profit thereby. Adopt resolutions which promise better cooperation in future. Automotive interests are not averse to reasonable regulation.

By Herbert Chase

KINDLIER feelings than in the past toward the bus and the truck on the part of New England railway men were manifested at the New England Motor Transport Conference arranged by the National Automobile Chamber of Commerce and held in Boston last week. It is dawning upon even those who have fought the newer forms of carrier that it is better to utilize these vehicles, or at least cooperate with those who operate them, than to spurn them or wage war against their legitimate use.

We say "legitimate" advisedly, for it is asserted that there are many unscrupulous or ignorant operators who do not know their costs and who, in order to get the business, cut their rates below cost and in the process of ruining themselves ruin reputable competitors also.

Buses and trucks are operated without taxes, without regulation and frequently without carriers' licenses or franchises and in territory where there already is adequate transportation, said electric and steam railway men, while the railways are taxed heavily, must comply with strict regulation and are responsible for maintaining regular service even though it may prove unprofitable at times.

To these contentions bus and truck operators replied: that they are taxed heavily in some States but are not averse to reasonable taxes based on relative use of the highways if funds raised by such taxes are used in maintaining and improving the highways; that they are in favor of reasonable regulation which will eliminate irresponsible operators; that they are not averse to franchises which protect their interests as well as those of the public; but that the railways must expect to meet competition or themselves provide the character of service which the public demands.

Conflicting Interests Composed

Whereupon supposedly conflicting interests found themselves more nearly in agreement than was thought to be possible and both sides learned through interchange of ideas and information with the other fellow.

Altogether the conference fulfilled its purpose in admirable fashion. It left the railway interests with a feeling that their problems are understood and appreciated and the automotive interests with a disposition to "play the game" without objection to reasonable control calculated to safeguard the interests of the public and of capital investments in present facilities. In short, the spirit of cooperation ruled.

Aside from the better mutual understanding which came as a result of the convention, the chief accomplishment was the adoption of a set of resolutions embodying this understanding and looking toward continued cooperation which will help to put into effect policies helpful to all concerned. These resolutions were adopted by a resolutions committee composed of two representatives each from the steam railroads, the electric railways, the independent bus operators, the truck operators, the commercial vehicle manufacturers and the State highway departments. Four representatives of the public were also members of the committee.

Agree to Regulation and Cooperation

The substance of these resolutions was given in the news columns of AUTOMOTIVE INDUSTRIES last week and is repeated in somewhat amplified form below:

Adequate transportation of all types is essential to continued progress in New England and public interest is served best by regulated cooperation of all transportation mediums.

Unregulated competition is wasteful and injurious to the community and irresponsible operators are a menace to the public and to the business of properly regulated competitors.

Present state commissions should be vested with authority to regulate all transportation facilities, including those of the automotive type, in order to insure continuity and reliability and other factors which make for good service to the public.

Carriers should be required to secure certificates of convenience and necessity where new routes are established and to take out insurance against injury to persons and property, including passengers and cargo.

Taxes on motor vehicles should consist of those in force at present when the proceeds are used for highway construction and maintenance, or those in exchange for franchise rights. But when taxes for franchise rights are imposed, the sums paid for other taxes should be deducted therefrom.

Legislation should be enacted to enable steam, electric and other public utilities to acquire, own and operate motor vehicles in conjunction with their regular lines of business.

Present public authorities in New England states charged with carrier regulation should join in formulating regulatory statutes for legislative consideration in order to place motor carriers under reasonable control.

Regulation of highway traffic, including size, weight and speed of motor vehicles, should be lodged in State highway departments and made as nearly uniform as possible.

Present State and federal cooperation in highway development should be continued.

Coordination and cooperation should be furthered by conferences between committees appointed by motor truck and railway interests in various localities where traffic is heaviest.

A permanent committee to be known as the New

England Transportation Council and composed of representatives of interests which took part in the conference shall be appointed to continue the relations established and seek to coordinate efforts along similar and related lines.

Alfred H. Swayne, vice-president of the General Motors Corp., at the opening of the convention said that New England is a gigantic terminal area with excellent highways which make it unusually well adapted for motor transport. Practically all movements are of manufactured goods of high value and for distances varying from one to thirty miles. Continuing, Mr. Swayne said in part:

"There has been a growing recognition during the past few years of the principle that one engaged in the business of common carrier by motor vehicle should be subject to regulation as to its rates and service just as any other common carrier. Destructive rate cutting is thus prevented and duly authorized motor vehicle common carriers are accorded the same protection given to other public utilities, this at the same time providing the greatest measure of useful service to the public. Through judicious regulation, and only in this way, will it be possible to obtain efficient, economical and adequate coordination of steam, electric and motor transportation service.

"Municipal regulation frequently interferes with the effectiveness of the common carrier service and the principle of regulation by State regulatory bodies has been quite generally adopted.

"In all cases the right to operate should be contingent upon the granting of a certificate of public necessity and convenience, and in the interpretation of that phrase the right of the public to select within reasonable limitations the type of service which it desires will have to be met.

"In some cases it may be found that motor transport, particularly by passenger bus, will meet the public need more fully than would any other type of conveyance. In some cases parallel types of transportation are desirable.

"As for the matter of taxation—always a moot issue — while decrying the principle that makes transportation the agency for taxation, it is my belief and that of my associates in the motor industry that the common carrier motor vehicle should be granted no favors which give it an undue advantage over the other agencies. If one agency is to be taxed, the other should be taxed.

"The question of which transportation facility is to occupy a given field will then be determined solely upon the relative service rendered to the public, and after all that is the only way in which any of these questions can be solved.

"The best interests of the public and the rail, water and motor carriers lie in cooperation between the various agencies of transportation rather than in wasteful competition.

"The greatest opportunity for cooperation is at the points where the capacity of the railroads is most limited and expansion is most difficult and costly; that is, in the terminal areas of our great cities."

This reasonable and constructive attitude on the part of the automotive manufacturer undoubtedly made a most favorable impression on railway operators, many of whom have been hit hard by bus and truck competition in New England. Since railway men have been fighting motor transportation agencies and the latter have been fighting back, it doubtless was inevitable that they should have it out, so to say, when the two factions were brought together, as they were in this convention. In consequence, a large proportion of the meeting was given over to arguments advanced by both parties.

Railways Fight Unfair Competition

The burden of the railway men's argument was to the effect that, without regulation, and with taxes, upkeep charges and fixed investment amounting to far less than those of lines using public highways, competition becomes exceedingly unfair to the railway. This, it was asserted, is true particularly in Massachusetts and on interstate lines where, if the railways wish to meet competition by themselves operating motor transportation vehicles, under the present law they are subjected to regulations which independent operators are not required to meet.

To this contention truck and bus operators replied in effect that they aim to give the public service which the railways cannot or do not supply and that the public is entitled to such service if it desires to use it, the difference in regulation and other factors being no fault of the motor transportation concerns. The New England Motor Coach Association has, in fact, instituted a considerable measure of voluntary self-regulation in the public interest.

There appeared to be practically no difference of opinion as to the value of the truck and the bus as transportation units of great value. Many railway men who are using them effectively testified to their value in certain classes of service, especially in supplementing existing rail facilities. These included representatives of the Pennsylvania, New York Central and New Haven railroads and numerous New England electric railway lines.

A number of bus and truck operators indicated a favorable attitude toward a gasoline tax which, it was contended, appears to tax the vehicle in proportion to its weight and the mileage it travels, thus presumably assessing the owner in approximate proportion to the wear on the highways used.

Representatives of the railways made much of the argument that trucks and buses do much damage to highways for the upkeep of which they are not adequately taxed. In some cases, especially in the smaller

"WE object to operation of trucks and buses which are untaxed and unregulated while other common carriers are taxed heavily and must comply with strict regulation," said the railway men.

"We are not averse to reasonable regulation and fair taxation the proceeds from which are used for road improvements," replied the bus and truck operators.

Whereupon both factions discovered that they are closer together than either supposed. Naturally this led to a better mutual understanding and agreements to cooperate.

This, in a nutshell, was the outcome of the New England Motor Transport conference, a report of which is given in these pages.

towns, this places a burden upon the community which it is not in a position to meet. In response to this some motor transportation representatives replied that they are prepared to pay their proportionate share of the burden for maintaining the highways they use and do in fact pay some taxes on this account at the present time.

It was pointed out by some that a permanent motor transportation system must be built upon a sound economic basis and that there is need to this end that operating costs be given careful study. If, as some contend, the public is demanding bus service in de luxe type of vehicles, it must be prepared to pay the extra cost of such service.

In response to requests for information on the cost per mile of bus operation, a number of figures varying from 20 to 31 cents were given for single-deck vehicles and one figure of 39 cents for double-deckers. It was indicated clearly, however, that costs vary greatly with operating, labor, road and other service conditions, so that it is virtually impossible to state in advance what costs will be. A representative of one bus manufacturer stated that a certain competitor, that is a manufacturer, had offered in one case to supply and operate his make of buses for 15 cents per mile—a figure which, he said, indicated the extreme lengths to which some makers are willing to go sell their product.

In several instances railway men complained that trucks and buses are sold to irresponsible individuals who operate them at such ridiculously low rates that ultimate failure of the project is inevitable. This, they pointed out, brings discredit to the automotive industry, in the mean time creating competitive conditions which tend to ruin the business of responsible operators without whose trade the truck or bus manufacturer would find it difficult to exist.

Resolutions of appreciation addressed to the N. A. C. C. which arranged the conference, were offered by railway representatives who indicated that much good had resulted from the frank discussion of all sides of the argument which the gathering had made possible.

American Society for Testing Materials Revises Standards

THE 1924 Book of Standards of the American Society for Testing Materials, 1315 Spruce Street, Philadelphia, Pa., which has only recently come from the press, contains the following "revised standards" of automotive interest (among many others):

Steel Castings (A 27-21)
Welded and Seamless Steel Pipe (A 53-21)
Automobile Carbon and Alloy Steels (A 29-21)
Cold-Drawn Bessemer Steel Automatic Screw Stock (A 32-14)
Cold-Drawn Open-hearth Steel Automatic Screw Stock (A 54-15)
Malleable Castings (A 47-19)
Copper Pipe, Standard Sizes (B 42-23)
Brass Pipe, Standard Sizes (B 43-23)
Chemical Analysis of Plain Carbon Steel (A 33-14)
Chemical Analysis of Alloy Steels (A 55-15)
Testing Shellac (D 29-17)
Testing Lubricants (D 47-21)
Testing Molded Insulating Materials (D 48-22)
Testing Cotton Fabrics (D 39-20)

Standard Definitions:

Terms Relating to Paint Specifications (D 16-22)
Rules Governing the Preparation of Micrographs of Metals and Alloys (E 2-20)
Annealing of Miscellaneous Rolled and Forged Carbon-Steel Objects (A 35-21)
Annealing of Carbon-Steel Castings (A 36-14)
High-Test Gray-Iron Castings (A 88-22 T)

A 1924 Book of Tentative Standards has also been published. This contains the following standards specifications of automotive interest:

Turpentine (D 13-21 T)
Zinc Oxide (D 79-21 T), as revised
Leaded Zinc Oxide (D 80-21 T), as revised
Basic Carbonate White Lead (D 81-21 T), as revised
Basic Sulfate White Lead (D 82-21 T), as revised
Red Lead (D 83-21 T), as revised
Ocher (D 85-21 T), as revised
Wrapped Air Hose for Use with Pneumatic Tools (D 46-23 T)
Braided Air Hose for Use with Pneumatic Tools (D 60-23 T), as revised
Rubber Belting for Power Transmission (D 53-23 T)

Standards specifications of automotive interest, continued—

Adhesive Tape for General Use for Electrical Purposes (D 69-22 T)
Determining Weight of Coating on Zinc-Coated Articles (A 90-23 T)
Determining Weight of Coating on Tin, Terne, and Lead-Coated Sheets (D 91-23 T)
Test for Specific Gravity of Pigments (D 153-23 T)
Testing Oleo-Resinous Varnishes (D 154-23 T), as revised
Test for Flash and Fire Points by Means of Open Cup (D 92-23 T), as revised
Test for Water in Petroleum Products and Other Bituminous Materials (D 95-23 T), as revised
Test for Water and Sediment in Petroleum Products by Means of Centrifuge (D 96-21 T).

Research Concerning Quenching Media

QUENCHING experiments were conducted during the past month with solutions of widely different physical properties in order to develop, if possible, those factors of greatest importance contributing to high "hardening power." No general conclusions can be drawn until further experiments and compilation of data have been made.

It is interesting to note that the addition of as little as 0.003 per cent by weight of sodium oleate to water at 20 deg. Cent. (58 deg. Fahr.) reduced the cooling velocity at 1328 deg. Fahr. from 150 to about 35 deg. Cent. per second; likewise 0.06 per cent by weight of "White Dove" soap caused a decrease from 302 to about 77 deg. Fahr. per second. The first mentioned solution is extremely unstable and "broke down" when used for the second time.

Ethyl alcohol (95 per cent) was found to have the lowest "hardening power" of any liquid so far tested.

Experiments with sodium chloride brines at 58 deg. Fahr. indicate a material decrease in hardening power as the concentration of salt in the water is increased above about 20 per cent.

Equipment for experimental study of pressure quenching has been designed and parts ordered.

Just Among Ourselves

Tire Is Sentimental Compared with Some Things

MERCHANTS of many kinds have been capitalizing the Christmas spirit ever since the Three Wise Men first offered their gifts. The automotive manufacturers and dealers only lately have entered the scramble for a part of the Christmas dollar, but their efforts already have met with well-merited success. There is considerable logic in the suggestion to "Give Something for the Car This Christmas." Anybody who still has any lurking suspicion that there isn't enough sentiment in a tire, for instance, to carry the Christman spirit should have his fears stilled by the fact that a manufacturer of plumbing supplies thinks enough of the chances of getting people to give water faucets and soap dishes as gifts to spend some $7,000 for a single page of advertising to tell the world about it. How would you like to open your stocking on Christmas morning and find that Santa Claus had left you a combination swinging spout sink faucet with spray attachment—fine for rinsing dishes, washing vegetables and cleaning the sink? There's romance for you! All of which indicates that the move away from useless giving is getting more momentum each year and that the sale of automotive products for Christmas gifts should increase proportionately.

How to Get a "Kick" Out of Exhaust Gases

CARBON monoxide gas from exhausts, despite its poisonous qualities, is not without distinct benefits to the motorist if properly utilized. Hauled up in court for drunken driving the other day, a New York motorist denied alcoholic inebriation and claimed to have achieved his jag as a result of inhaling carbon monoxide gases from exhausts. Only trouble was that he wasn't having much luck selling the judge on that idea, according to last accounts. Boy, page Mr. Volstead.

Removal of Slow Traffic Suggestion Made in Paris

PROPOSAL is being made in Paris to remove the horse and other slow moving traffic from the streets during rush hours; also to restrict parking facilities, to limit the length of trolley cars, and to increase the number of one-way streets. The drastic character of the first mentioned measure is especially interesting in view of the fact that Paris traffic probably is not nearly so congested as is that of several of the larger American cities. The measures advocated in Paris evidently look to relief of congestion before it becomes intolerable, as it already has in certain American metropolitan areas. Further proposals in Paris advocate building of overhead tracks for automobiles in certain places and elimination from crowded streets of all except small cars.

Riding in Comfort vs. Walking in Expense

PEOPLE would rather ride in cheap or well-worn clothes than walk in high priced Sunday suits. This conclusion is to be drawn from statements made the other day by a spokesman for the woolen industry who charges the motor vehicle with responsibility for limitation of expenditures on men's clothing and for the virtual disappearance of the Sunday suit. Sometimes it seems as though civilization were on the upgrade after all.

Results and Romance in Highway Building

HOW the British do manage to cloak with the glamor generated by euphonious nomenclature many of the dull, drab activities of a commercialized civilization! We are struck by announcement of a banquet held by the Worshipful Company of Paviors, presided over by its master, E. G. Price, who with his wardens "pressed forward a proposal" for something or other. The flavor of medieval craftmanship arises from the whole report. But what's in a name, after all? The Road Contractors' Association, arguing about an idea which its executive committee is trying to put over, undoubtedly does just as much toward increasing the mileage of good roads at minimum cost. Perhaps it does a lot more. Who knows?

Biggest Cash Prizes Ever Offered for European Race

CASH prizes for the 1925 Grand Prix are 150,000 francs for the winner, 30,000 for the second and 20,000 for the third. At the present rate of exchange this would amount to approximately $8,205 for the winner, $1,641 for the second and $1,094 for the third. Compared to the sums won at the Indianapolis Race last May they are "not so much," but they are the largest ever offered in Europe. Entries are open until January 31 at a fee of 5000 francs, roughly $275 and from that date until March 20, 1925 at double that amount. Expenses considered, American entries would have to be for advertising or for love of the sport. Spent in Paris, the prizes . . . but who can talk of spending in Paris without longing.

Traffic Congestion May Promote Motor Boating

THERE is much talk of an increased interest in motor boating. Several automobile executives think that the tremendous traffic congestion which now exists in many cities will make a greater number of people seek the rivers and lakes for pleasure transportation. The development of a standardized low-priced motor boat seems to be needed if this sport is to gain a high degree of popularity.

N. G. S.

Effect of Tires on Riding Comfort Reduced to Mathematics

Non-skid tread action explained. Proportion of load carried by walls of fabric, cord and balloon tires. Lateral stability and width of rim. Graphic records.

VARIOUS phases of recent development work in the tire field are illuminated by the paper on "The Tire as Part of the Suspension System" presented to the Institution of Automobile Engineers by A. Healey of the Dunlop Rubber Co.

Concerning non-skid properties of tires, the author says the first step toward this type was the provision of a tread having a more or less deeply formed pattern. Following are the reasons for the better non-skid properties of a broken tread:

1. The plain-tread tire must of necessity slip on the road even when simply rolling, in much the same way that a belt must slip on a pulley. This may be demonstrated easily on an ordinary type of tire-testing machine. Some tests were made on plain and broken treads, and the slipping of the former was evident by the shrieking noise it produced, even when no driving force was being used. The power consumption of the tire was also greater.

As is well known, the coefficient of friction between two bodies at rest is far greater than when they are sliding one on the other. The plain-tread tire is compelled to slip, and thus its coefficient of friction is reduced. In the case of a suitably designed broken tread, however, the individual elements of the tread act as the feet of caterpillars, and the necessary slip is taken up in the rubber tread itself. For practical purposes, the tread in contact with the road is instantaneously at rest, and exerts a correspondingly greater hold on the road.

2. Considering the surface of contact of a plain-tread tire, it is clear that the cutting away of rubber to form a pattern cannot appreciably alter the general elliptical shape, but merely causes a greater load to be borne on the remaining portions. The result is that the total area of contact is reduced, and therefore the average pressure between tire and road is increased. On certain types of muddy roads this increased pressure is an advantage, enabling the tire to penetrate the mud and to grip firmly the hard road beneath. In actual practice the road pressure is increased by approximately 33 per cent.

Outlet for Mud

3. The spaces between the tread elements serve as an outlet for mud, and the tire has a better chance of gripping the road on this account also. When the tire is traveling at speed, there is very little time for squeezing out the mud, and the smaller the elements of the tread the shorter the time required.

When skidding is just commencing, the pressure between tire and road is greatest at the edges of the pattern. This may be shown with a piece of eraser rubber, by causing it to slide on a piece of paper. With a broken tread, therefore, there is a good chance of the tire recovering itself quickly when it has begun to skid, because it scrapes the mud away in front of it. This action is probably the most important of all.

In a tire which is inflated and deflected under a load, a certain amount of the load is supported on the materials of the tire, by virtue of their stiffness. The precise amount of the load so carried may be deduced as follows:

If a certain tire be deflected a definite amount, by a series of differing loads and inflation pressures, a straight line relation will be found to exist between the loads and inflation pressures. By producing the straight line to cut the zero pressure line, the load required to deflect the tire material is found. In a typical example given by the author the load required was 1 cwt., and with 7 cwt. as a fair average load for the size of tire, one-seventh of the load is carried by the tire walls. With fabric tires, which had comparatively thick and stiff walls, as much as one-third of the whole load was carried by the walls. The author states that so far as cord tires are concerned there is no material change in the stiffness of the tire with the inflation pressure, although there is in fabric tires in which the threads are compelled to slide over one another.

A smaller proportion of the total load is carried by the materials in balloon than in ordinary tires. The walls are both thinner and longer and therefore are more easily bent. However, if the balloon tires are run at the proper inflation pressures, the walls actually bear a larger proportion of the load and, in consequence, the power lost in the balloon tire is greater.

Table I

Size	Load per Tire, Lb.	Inflation Pressure, Lb. per Sq. In.	Deflection, Mn.	Load Carried by Tire Walls, Lb.
34 by 7.30 balloon.	1,700	35	34	260
33 by 5	1,700	60	23	220
32 by 6.20 balloon.	1,300	30	31	260
32 by 4½	1,300	50	23	150

The larger the tire the lower must be the inflation pressure in order to give a definite deflection. Since the larger tire is more elastic (has less damping), it follows that the pressure in it must be still further reduced in order that the comfort of the passenger shall be maintained. To obtain a real advantage in comfort, the pressure in the large tire must be reduced yet again. *It is quite futile to change to a larger tire and depend on the lower inflation pressure (per se) to give additional comfort.*

A typical case may be given as an illustration. To replace a 3-in. ordinary tire at 40 lb. per sq. in. we require a 4.40-in. tire to be at 35 lb. in order to give an equal deflection. To counteract the loss of damping involved, the pressure must be further reduced, to about 28 lb. per sq. in., and to obtain a really substantial *increase* in comfort the pressure must be reduced to 22 lb. per sq. in.

In the case of a very large size of balloon tire, the increase of flexibility of the wall is so great that the same deflection is obtained with the pressures used in ordinary tires. For example, the 7.30-in. tire at 40 lb. per sq. in. has the same deflection as the 5-in. tire at 40 lb. per sq. in. To counteract the loss of damping, a reduction to 30 lb.

per sq. in. must be made, and to gain a substantial amount in comfort the pressure must be 24 lb. per sq. in.

Wide vs. Narrow Rims

The author has something to say on the relationship between rim width and lateral stability. He admits the truth of the contention that the wider the rim the greater the degree of stability, but says that an extra width of rim means a shorter tire wall and less flexibility. It is quite credible that the lowering in inflation pressure which generally goes together with increased rim width has an influence on the problem, and to settle this the same car was fitted alternately with two sets of wheels, one set shod with 30 x 5.25-in. tires on a 3½-in. rim, the other with 30 x 5.25-in. tires on a 2.68-in. rim. In each case the tires had been designed for the rims and were of the correct dimensions when fitted. The same inflation pressure was used in both cases. Four experienced drivers then drove the car around a 3-mile course having stretches of good and bad roads and many difficult corners. The drivers were led to the car blindfolded and therefore did not know which set of tires they were using, and the net result of the tests was that the differences were undiscernible, although two of the drivers had formed "impressions" before the test that one set was better than the other. The experiments were repeated with a large car using 7.30-in. tires with similar results. Very low tire pressures were used in both cases, 15 lb. per sq. in. on the small car and 20 lb. on the large one.

A distinction is made by the author between the theoretical stability as ascertained by pulling a stationary car to one side, and the actual stability. The problem of rolling is a dynamical one and cannot be determined by static methods. In very extensive road experience with all sizes and types of balloon tires the author never observed any dangerous roll or lack of control, even with extremely low inflation pressures. That is generally termed "rolling on corners" is not dangerous and is not due to the lateral "give" of the tires. The weight of the car then is very largely thrown on the wheels on the outside of the curve, and the softer the tires the more will the car tilt over. This tilting is mistaken for rolling.

A good deal of publicity has been given to pictures of balloon tires absorbing small obstacles. Such obstacles, the author says, do not interfere in the least with riding comfort, and he proved mathematically that if a car passes at 25 m.p.h. over a cylindrical obstacle 2 in. in diameter the velocity imparted to an unsprung weight of 1 cwt. would be only 1/120 ft. per sec., which is exceedingly small. Very large obstacles are required to cause a severe jolt to the passengers.

Taking records of actual movements of a car in order to determine its riding qualities is useless, says Mr. Healey. A set of such records is given in Fig. 1. These were taken on an instrument of the seismograph type, consisting of an inertia beam with a period of vibration of about 5 seconds and a suitable recording mechanism. The line traced out is the actual vertical motion of the car. The tests were made over a transverse rut in an otherwise good road, first with ordinary tires and then with very soft balloon tires. There was without doubt complete elimination of the jar with the latter tires, but the actual movements of the chassis were greater. From the vertical movement of the car the accelerations have to be determined by double differentiation, and even with the most precise record of movements or displacements a considerable error may be made in deducing the accelerations.

The natural period of vibration of the chassis is determined by the spring factors of both tires and springs. The use of balloon tires thus alters the period of vibration of the chassis, and the disadvantages of galloping and motion tending to sea sickness are thus explained. If a car has been designed to have 85 vibrations per minute with hard tires, it may easily have only 80 with balloon tires, and when heavily laden will have still less. The period required to give the seasick feeling probably varies with different individuals, but it is plain that any considerable increase in period over what has been found by experience to be best is undesirable.

Axle Motion When Car Is Pitching

It is pointed out in the paper that when a chassis is pitching the axle is also executing a corresponding vibration of smaller amplitude. The softer the tires the longer is the natural period of the chassis and also the greater the movement of the tires in pitching. This may be explained best in figures. Suppose the chassis to be pitching with an amplitude of 6 in. The axle will be moving up and down with an amplitude of, say, 1 in., so that the springs are compressed 5 in. Now, if softer tires are fitted, for the same pitching of 6 in. the axle will move more, with an amplitude of, say, 2 in., and the springs are compressed only 4 in.

The damping in the springs is several times larger than that in the tire, and by transferring some movement from spring to tire we have produced a system which has a very much reduced damping action for the pitching motion. Consequently, the pitching of a car on soft tires is longer continued than would be the case on hard tires. In a similar way it can be shown that there is a greater possibility of the pitching assuming a large amplitude. Con-

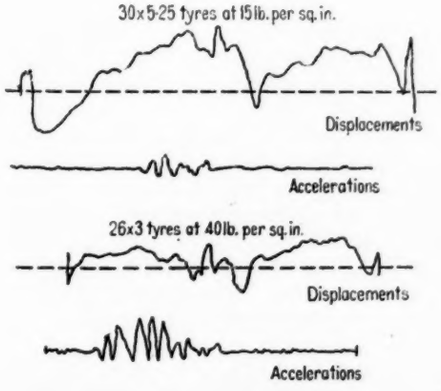


Fig. 1—Curves showing the vertical movement and acceleration of car passing over obstacle in road

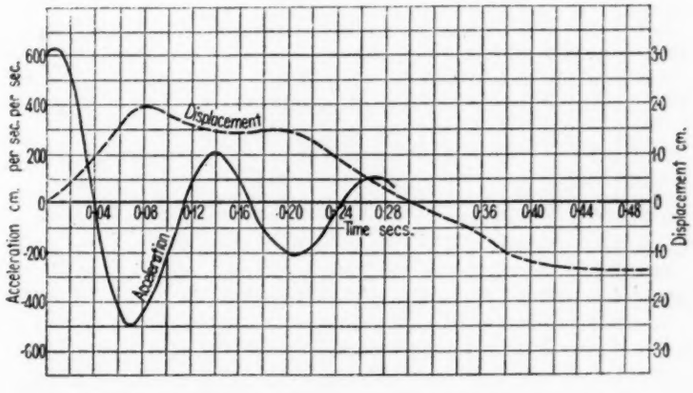


Fig. 2—Calculated curves of chassis movement and acceleration, showing acceleration to have a period corresponding to the natural period of the axle

sequently, it may be concluded that softer tires tend to pitching and to less damping out of pitching motion.

In a mathematical appendix it is shown that the chassis has two natural periods of vibration and two damping factors. The second natural period coincides with that of the axle vibrating between the chassis and road, with a spring on both sides of it. This period is substantially the same as that calculated by assuming the chassis fixed and the axle vibrating. The natural damping factors of the suspension system are not equal to those of the spring and tire as determined separately.

In Fig. 2 the dotted line shows the displacement of the chassis when the wheel is suddenly struck by an obstacle and caused to move upward with a speed of 400 cm. per sec. The curve of displacement is calculated by an equation and from assumed data given in the paper. The chassis begins to oscillate with a period of 0.68 seconds but follows a somewhat irregular path. The irregularities are produced by vibrations of the axle, having a period of about 0.13 second. Although the axle appears to have very little influence on the movements of the chassis, yet it almost wholly determines the accelerations, for we see that the full line shows the acceleration to have a period of 0.13 second the same as that of the axle vibrations.

Wider Introduction of Motor Transport Needed in Mozambique

MOZAMBIQUE, on the east coast of Africa and opposite the island of Madagascar, is the foremost of the colonies of Portugal. The whole of its landward boundaries abut on British soil, and it is through Mozambique that the Transvaal, Nyasaland and much of Rhodesia must find an outlet to the sea.

The railways have been built to cope with its transit trade; plantations have been established or are springing up on each side, and lumber and mineral concessions are being worked in their vicinity. Wider introduction of motor transport is needed to open up to a still greater extent the areas through which these railways run.

It would appear that the most economic methods of opening up the province would be to utilize waterways and to make the many ports, especially those of the north, centers of motor transport activity.

There are many miles of motor roads in Lourenco Marques, much of them macadamized. Good roads, too, exist in the neighborhood of the towns, especially toward the Transvaal border.

The best system of motor roads lies on both sides of the railway running from Beira to Umtali. These roads are the work of the Mozambique Company, and provide an object lesson, not only to Portuguese East Africa itself, but to other parts of Africa, as to how profitable motor transport can be made to operate with railway and river traffic. Other motor roads built by this company proceed from the Beira Railway southward to the Limpopo and northward to Sena and Tete on the Zambesi. From Tete a good road runs beyond the northern frontier to Fort Jameson, in Rhodesia, and just beyond the frontier this is joined by a road from Chikoa.

The total number of motor vehicles in Portuguese East Africa cannot be more than 500, the majority being of American make. Lourenco Marques is by far the most motorized town in the Province, and yet only 172 automobiles and 25 trucks, mostly of a light type, were operating there a year ago.

The Mozambique Company has a number of passenger and commercial vehicles operating both in Beira and in the interior. Sixty-eight motor cars were imported into Portuguese East Africa in 1920, but there was a big fall, due chiefly to unfavorable exchange and general depression, in 1921. Some improvement has taken place during the past three years. A retarding factor, so far as the unconceded portion of the province is concerned, is the 15 per cent ad valorem import duty on passenger cars and a similar duty of 5 per cent on trucks. The Government justifies its attitude in this matter by stating that the money raised is needed for road maintenance.

Tractors, for which there is a great need in Mozambique, are imported duty free. It has recently been stated that tractors are in considerable demand, especially for the cotton fields.

A feature of river communication in Mozambique is the number of lateral waterways that connect the various rivers. Apart from the value of this route for the tapping of the regions through which it runs, it would give the settler the opportunity of using the port that is, for the time being, best able to deal with his produce. In the Lourenco Marques district a number of motor launches are used on the waterways, and these will eventually substitute the dhow type of sailing vessel at present utilized. Other rivers besides those mentioned are capable of carrying motor launches.

Petroleum is being actively prospected for in Mozambique, and it is expected that the traces that have been discovered south of the Zambesi and in the neighborhood of Inhambane will result in the establishing of an important oil field. Should this prove the case, motor transport in the Province will receive an immediate fillip, as gasoline is very expensive at present.

A developed Mozambique will never be in need of motor fuel, however. Many of the colony's agricultural products, especially sugar and maize, can be grown in such huge quantities that no ill effect would be felt if a portion of these crops were used as raw materials for the extraction of enough power alcohol to satisfy local fuel demands. Benzol from Tete coal is also another possible source of supply.

AT a dinner commemorating the twenty-first anniversary of the organization of the Commercial Motor Users Association in England, Sir W. Joynson-Hicks said that twenty-one years ago there were about twenty gasoline trucks and one thousand steam wagons in the country, and no one would have dared to prophesy that within twenty-one years there would be 203,156 commercial vehicles in use, of which number about 30,000 were propelled by steam and 20,000 by electricity. It was stated by the chairman of the association that 65,000 more people were employed in the commercial transport of the country than by the railroads.

THE importation of passenger cars weighing up to 6600 lb. into Portugal has been forbidden, with effect from Aug. 6 last. The reason for the embargo, which undoubtedly will be of a temporary character only, is to be found in the country's financial difficulties.

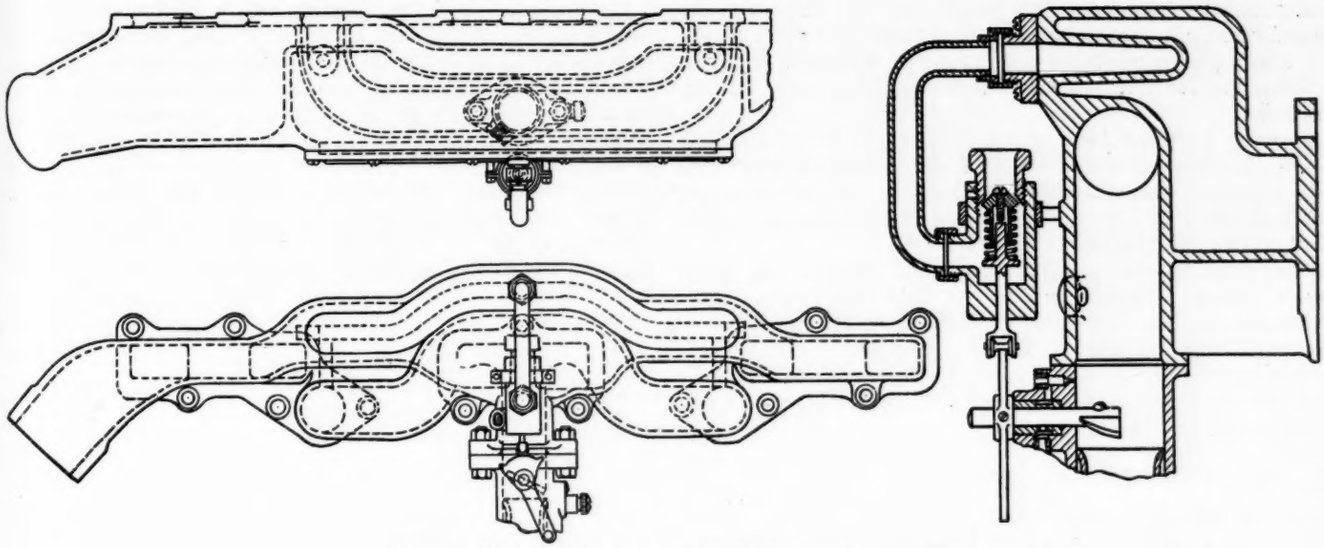


Fig. 1—Penfield manifold and mixture control system

New Device Enriches Charge for High Speed and Heavy Pull, and Leans It Otherwise

Supplementary air valve is operated by manifold suction and through connection to the throttle. Modified intake and exhaust valves used in addition to the carbureter.

By W. L. Carver

WITH the object of enabling an engine to give a maximum power output and at the same time operate on an economical mixture, without change in carbureter setting, a new carbureting and distributing system has been developed by a group of Chicago engineers. It comprises, in addition to the usual carbureter, modified intake and exhaust manifolds and a special auxiliary air valve which is controlled by the vacuum in the intake manifold and also mechanically through a cam on the stem of the throttle valve.

The cut shows an experimental installation on a Continental six-cylinder engine in plan and elevation, and a section through the auxiliary valve and upper portion of the carbureter. The throttle valve lever has formed on it a cam which engages with a plunger acting on a poppet valve. The latter has a seat on an adjustable sleeve screwed into the upper end of the auxiliary valve housing, and is fitted with an adjusting screw which contacts with the upper end of the cam controlled plunger. At the side of the auxiliary valve housing is an outlet which connects, by means of a copper tube, with a passage cast in the exhaust manifold, serving as a heating chamber. This passage follows the exhaust manifold, and at the outer ends holes are drilled through bosses into the intake passage, at right angles to the center lines of these passages. The heating chamber is closed by a bolted-on cover.

The total travel of the control plunger is approximately 3/16 in. The cam sagment is so arranged that the auxiliary valve is closed at "cracked" and wide open throttle positions and substantially fully open throughout the ordinary driving range, usually 18-40 m.p.h. When in the closed position the auxiliary valve is held on its seat by the adjusting screw, the valve spring being highly compressed. At about 8 m.p.h. the plunger begins to move down, decreasing the loading of the valve spring, and at 18 m.p.h. it is clear down, a distance of 3/16 in. This opening continues until a speed of 35-40 m.p.h. is reached, at which time the plunger begins to travel upward again, reaching the closed position at full throttle opening. These car speed figures, of course, are based on ordinary level road driving conditions.

How Sizes Were Determined

In the course of the development work, which included dynamometer and road tests as well as exhaust gas analyses, the engineers arrived at auxiliary air valve and heating chamber sizes which produce an intake mixture temperature of approximately 130 deg. Fahr. when the mixture ratio approaches 12:1, which corresponds to maximum power. In the maximum economy range, which approaches 17:1, the intake mixture temperature is approximately 190 deg. Fahr. The auxiliary air stream is heated to a high temperature, which may approach 700 deg. Fahr., and then introduced into the main intake stream as close as possible to the ports. Also, this stream of heated air is introduced at right angles to the flow of the main intake stream, in order to induce turbulence which, in conjunction with the high heat, tends to break up any globules just before they enter the cylinder.

As the auxiliary valve is controlled through a spring rather than through a positive connection, compensation for hill climbing and acceleration at speeds within the economizing range of the device is permitted. When the throttle opening is increased, the vacuum in the intake manifold drops instantaneously. Therefore, the auxiliary valve closes and the mixture entering the cylinders is

automatically richened. In a like manner, the drop in speed when hills are negotiated at a nearly constant throttle opening also produces a decrease in manifold vacuum, so that the auxiliary valve tends to close and build up the mixture.

It must be understood that this device must be fitted to a specific type of engine by road and dynamometer tests. The capacity and characteristics of the device must be worked out to fit the peculiarities of the carbureter, manifold, engine, car weight and gear ratio.

An experimental installation of the system has been made also on a Dodge engine. In this case a steel tube is cast in the exhaust manifold to form the heating chamber, and this installation is more responsive than that shown in Fig. 1, in which there is a perceptible thermal lag due to the high heat capacity of the cast iron walls of the heating chamber.

Naturally, this device has no effect on the maximum power of the engine but shows a decided increase in car mileage and a decrease in the CO content of the exhaust. The percentage of carbon monoxide in the exhaust is an excellent indication of the efficiency of combustion. A very low content indicates that practically all of the potential energy is converted into heat energy in the cylinder. In one road test, the mileage per gallon is said to have been increased from 18 to 28.8 by the use of this system. Under the same conditions, the CO content of the exhaust dropped from 8.6 to 2.6 per cent. The results of another test of a larger car and engine are tabulated as follows:

Average speed, m.p.h.	20.0	30.0
Miles per gal. Std. arrangement	13.1	16.8
CO content in exhaust, per cent	4.0	3.2
Miles per gal. auxiliary equipment	22.3	20.1
CO content in exhaust, per cent	0.8	0.5

Clark Axle Designed for 18-Passenger Buses

A SEMI-FLOATING, helical bevel gear rear axle designed especially for bus service now is being marketed by the Clark Equipment Co., Buchanan, Mich. This axle has a 68-in. tread and a maximum load rating on the spring pads of 6000 lb., which makes it suitable for buses of 18 to 20-passenger capacity. It is designed for a maximum driveshaft torque of 180 lb. ft. Double internal brakes, which now are used on all Clark bevel gear axles, are a feature of the new unit. The weight of the axle is 550 lb. and it is offered with reductions of either 5.5 to 1 or 6.28 to 1. The range of spring center distance is 44 to 46 in.

Except for differences in dimensions made necessary by the wide tread, the design of the axle follows that of other Clark bevel gear units. The banjo type housing and the differential and pinionshaft carriers are electric steel castings. The pinionshaft is straddle mounted in a double row ball bearing at the front and a single row at the rear. Pinion and ring gear are of nickel steel, and have a diametral pitch of 3.64 and a face width of 1⅞ in. The differential is of the four pinion type and is carried on taper roller bearings. Axle shafts are of S. A. E. No. 3140 steel and are supported in taper roller bearings at their outer ends. The axle is designed for Hotchkiss type drive, but can be used with radius rods. Spring pads are arranged for underslung springs. Minimum road clearance with 32-in. tires is 9 in.

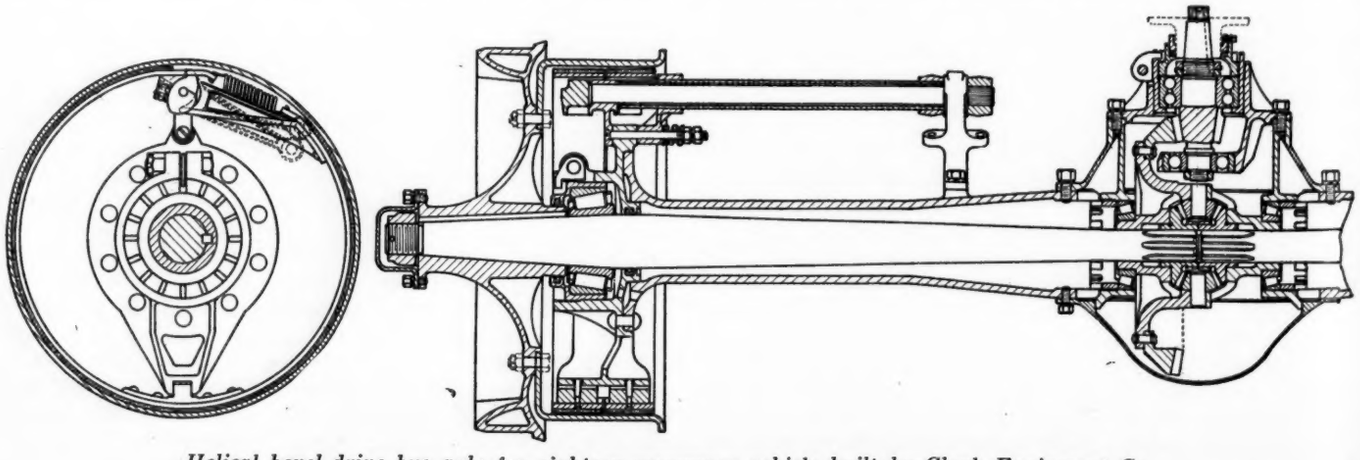
Both service and emergency brakes act internally on the same drums. The bands are 2½ in. wide and are located side by side. They are supported by cast steel brake carriers which are riveted to the axle housing. The inner ends of the brake operating shafts are supported by brackets which are bolted to bosses on the axle housing. These shafts are concentric, the inner shaft operating the outer brake and the outer one the inner brake. Brake levers on the inner ends of these shafts are a serrated fit to permit adjustment. The brake bands are expanded by cams and are anchored by a lug which fits in a slot on the end of an arm on the brake carrier.

Bean Making 1½ Ton Truck

MAKERS of the Bean passenger car, Harper Sons & Bean, Ltd., Dudley, England, have introduced a truck chassis with a useful load of approximately 1½ short tons, wheelbase of 126 in. and 54 in. track. The powerplant is almost identical with that of the passenger car, and consists of a four-cylinder 75 x 135 mm. (approximately 145 cu. in.) L-head engine developing 32 b.hp. A five-plate dry clutch is used with an adjustable spring-loaded clutch stop. The unit gearset has four speeds.

Apart from the powerplant, the chassis is designed throughout for truck service. There is nothing unorthodox about the layout, which comprises an exposed tubular propeller shaft, Hotchkiss drive, semi-floating banjo type rear axle, all brakes within the rear wheel drums.

Pressed-steel hollow-spoked wheels are fitted with straight-side 32 x 4½-in. pneumatic tires. The chassis price is £265, including lighting generator but no starter.



Helical bevel drive bus axle for eighteen-passenger vehicle built by Clark Equipment Co.

Excess Plant Capacity Is a Serious Problem for Both Large and Small Producers

Ford is utilizing surplus space for manufacturing accessories. Some companies have disposed of extra facilities and reduced their production in order to show a return on invested capital.

THIS is the eleventh in the series of articles on Profits Versus Volume, the first of several on Utilization of Plant Capacity. The Twelfth Article will appear in an early issue.

THE most efficient utilization of present factory manufacturing capacity is a question requiring more comprehensive analysis now than has been demanded at any time since the war. In the last five or six years all manufacturing divisions of the automotive industry have reached that significant point in their industrial history where production has ceased to be the major problem and where marketing has necessarily assumed first importance.

Merchandising has become the problem of every maker for the first time in the life of the industry. Producers of the lowest priced, the middle priced and the high priced vehicles are all facing the same situation.

The fact that total motor vehicle production for 1924 may be 20 per cent less than the record production of 1923 is a definite pronouncement of excess plant capacity. And this excess plant capacity is not confined to small producers.

Even Ford, who has seen the handwriting on the wall, is commencing to take up the slack by entering the accessory field. It is not so easy for other manufacturers to suddenly change their production. Non-operating and non-producing plants will mean eventual elimination and a considerable reduction in the excess capacity of industry.

Some of the small companies have their plant capacity and invested capital so balanced that by producing a small number of cars or parts they can still enjoy a satisfactory profit. What is true of these manufacturers may be applied to many branches and dealers. The crux of the problem that any and all manufacturers have to solve today is, how to determine an equilibrium between invested capacity and possible sales.

A more definite picture of potential sales can be visualized from Ford's 1924 output. That it will fall behind that of 1923 is admitted. What has he done to utilize express plant capacity? Part of it has been taken up by manufacturing accessories for Ford vehicles. This means keener competition and possible reduction in volume of sales for other companies in the same lines.

Change in Complete Perspective

This latest manufacturing step by Ford calls for a substantial rearrangement of the complete perspective. It indicates that the question of excess plant capacity is of considerable and increasing importance today, and that it is a vital and involved problem which must be faced and solved in the near future.

The possibility of utilizing excess plant capacity in any division of the industry, whether in the manufacture of complete vehicles, the manufacture of component parts entering into the chassis, or the manufacture of accessories for these vehicles, is influenced by the larger producers' plans and changes in operation.

The question was materially altered when the program of complete car equipment took so important a place two years ago. It took on a new significance when Ford initiated the manufacture of accessories, and it may take on a still different and enlarged perspective when other large manufacturers initiate similar manufacturing activities.

Excess plant manufacturing capacity demands more than a study of the potential purchasing capacity of the country. It means studying the future manufacturing programs of these large manufacturers in their efforts to take care of their own excess manufacturing capacity. The problem has changed from that of a study of the growth of the industry to that of detecting the future programs of large manufacturers.

Once the general situation is deciphered, the final test becomes a problem of establishing equilibrium between invested capital and the ability to produce and merchandise. The question is a double one today. First comes the mapping of the entire manufacturing field, and second comes the determining of the relationship between plant capacity and possible sales.

A very definite consideration of both is essential. No program for the utilization of excess capacity can be satisfactorily and profitably carried out by considering only one.

What Has Been Done

The past two years have witnessed the putting into execution of many methods for taking up excess manufacturing capacity. New lines have been added with but one dominating thought, namely, to fill the shop and keep it busy. That has proved a herculean task, an impossible one with many concerns. It would have been better to have sold a part of the factory rather than try to hold it all and be compelled to produce at a volume so low that there was not a return on the invested capital.

A few leading concerns disposed of extra facilities. They reduced the scope of their production in order to show a return on invested capital.

This showed sound judgment in most instances, because no business can continue unless a reasonable profit is earned on the money invested.

Enthusiasm may carry the stockholders along, sometimes for a long period, but it must necessarily end. Remedial treatment then is generally more severe than any earlier plan which might have been devised and executed.

No attempt has been made here to solve this problem with its numerous ramifications or to suggest how it can be solved, but the manufacturers in the industry cannot afford to neglect a thoroughgoing study of a situation on which their future depends.

New Device Designed to Remove Water, Gas and Dirt from Lubricating Oil

Fuel diluent and water are evaporated in heating element while other foreign matter is filtered out. Tank employed is practically same as that used in Oil-Vac.

As announced in the news columns of this publication, recently, Byrne, Kingston & Co. of Kokomo, Ind., now are marketing a new device known as the Kingston Oil Aerator and Filter Tank, the purpose of which is to remove foreign matter, including dirt, fuel and water from oil in the lubricating system of the engine.

So far as the tank itself and its operating mechanism is concerned, the device is substantially identical with the Kingston Oil-Vac tank, a fuel feeding device placed on the market about two years ago and described in AUTOMOTIVE INDUSTRIES of Oct. 19, 1922. The aerator, however, pumps oil and air instead of gasoline and makes use of the inlet manifold vacuum instead of that created by an oil pump as in the Oil-Vac.

As will be seen from the accompanying cut, oil, together with some air, is drawn from the bottom of the crankcase of the engine, through copper tubing to an exhaust heated reservoir and thence is delivered into the upper air or float chamber of the tank. When the level in this chamber reaches a certain point, the float mechanism opens a valve and spills the oil from the chamber to one below it in which the filter is located. After passing the filter, the oil returns to the crankcase of the engine by gravity.

It should be noted that the oil taken from the crankcase is not only heated, but is mixed with air entering through an air bleed when it leaves the crankcase and that the air from the lower chamber of the tank is forced to bubble through the oil just prior to and during the time that the oil spills from the upper to the lower compartment. Furthermore, the heated oil is subjected to sub-atmospheric pressure during the time that it is warm, so that there is an additional tendency to evaporate water and fuel content. All vapor and the air asperated, of course, are drawn into the inlet manifold of the engine and are mixed with the charge entering the cylinders.

Heating the oil can be done either in a reservoir cast integral with the exhaust pipe or in a separate reservoir with one concave side which can be fastened against the exhaust manifold or exhaust pipe by a suitable U-bolt.

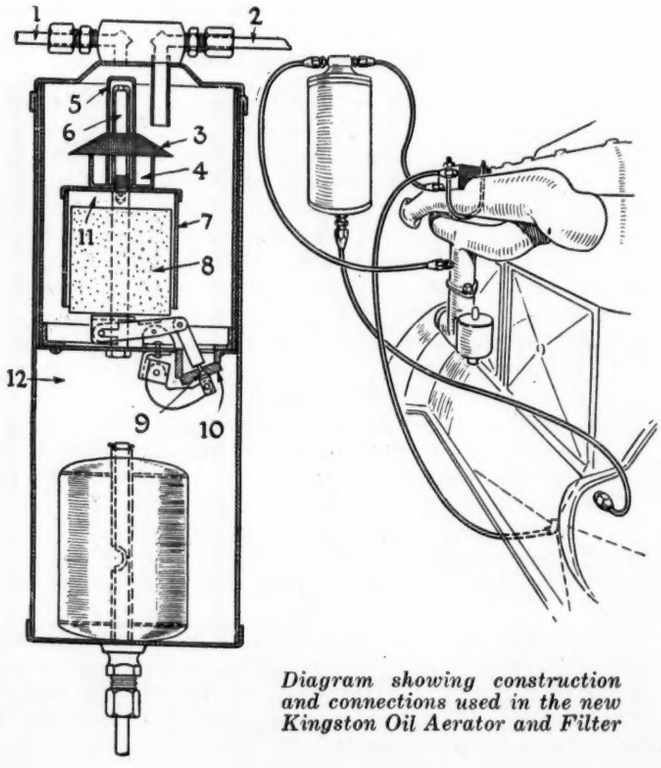


Diagram showing construction and connections used in the new Kingston Oil Aerator and Filter

Oil Flow Intermittent

Since the oil flow is intermittent, due to the alternate filling and spilling of the vacuum tank, there are dwell periods during which oil in the reservoir remains for quite a period in contact with the hot walls of the chamber, care being used to place the chamber in such position that it will not drain back into the crankcase when the vacuum is relieved temporarily.

In the lower chamber of the tank is a brass standpipe open at the top end and with a second opening about 2 in. above the tank bottom. Over this pipe fits a spool covered with a canton flannel tube, the ends of which are fastened over the spool flanges. This flannel forms the filtering medium for the oil, which can reach the lower opening only by passing through the filter, since the tubular spindle of the spool fits the standpipe closely. Much of the sediment which reaches the lower chamber settles out before the oil passes the filter. If, due to high viscosity resulting from low temperature or some other cause, the oil cannot pass the filter fast enough, it overflows the top of the standpipe, but still is subjected to the settling action.

The float tank forms a separate unit which fits into the top half of the filter tank and serves as a cover for the latter. This unit can be lifted out readily, after which sediment which has accumulated around the filter is removed easily, while the filter also can be removed and cleaned or renewed.

Aerator Functions Independently

It is worthy of note that the functioning of the aerator in no way interferes with and is entirely independent of the engine lubricating system proper, so that, even if the device should fail to function, the lubricating system will remain intact but, of course, without the benefits of the filtering and evaporating action of the device during the period.

Installation of the aerator, even on a car already in service, is a simple matter, since it is designed to be attached to small fittings which replace those forming a part of the original engine. For example, the suction line usually is attached to a tee which replaces the fitting always used where the conventional vacuum fuel feeding system attaches to the inlet manifold.

Similarly oil usually is drawn from the crankcase of the engine by way of a special plug which is substituted for the ordinary oil drain plug or cock and is returned to the crankcase via the breather, filling spout or a plug or capscrew in the timing gear case. All these connections are made with ordinary copper tube fittings, the tube from crankcase drain to top of the float tank passing through the heater. The heater is so proportioned that the temperature of the oil leaving it does not exceed 160 deg. Fahr. in the usual case. The heater can be omitted if desired, as is done in some Ford installations, but in this case a smaller proportion of the fuel content of the oil is removed.

For those who are not familiar with the operation of the float and spilling mechanism, which is exactly the same as that employed in the Oil-Vac tanks, the following explanation is given: Under influence of vacuum in tube 1, connected to the inlet manifold, the pressure in the float chamber is reduced and with it the pressure in the suction line 2, which is connected through heater to bottom of crankcase. The partial vacuum draws the oil through 2 and permits it to spill on screen 3, a part of the oil entering the open cup 4. The oil in the cup seals the lower end of tube 5, the upper end of which communicates through tube 6 with the interior of the inverted cup 7, which surrounds the float 8. When the float is down, in position shown, the linkage to which it is connected holds the small valve 9 and larger valve 10 in closed position.

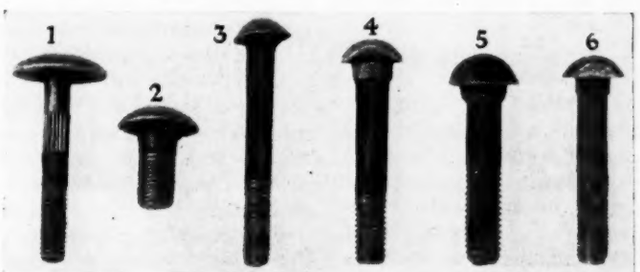
Since the lower tank is open to atmosphere, while the float tank is under partial vacuum, the difference in pressure also tends to hold the two valves 9 and 10 closed. Oil continues to enter the float tank and the level rises, closing the space between the float 8 and the inverted cup 7. Further increase in level compresses the air in space 11 and connecting tubes 6 and 5 until this pressure is just sufficient for the air to overcome the static head of oil in cup 4 and bubbles through this oil.

This decrease in pressure permits the float to rise and first open the small valve 9, admitting air from the filter chamber 12. This air, however, must bubble through the oil before possing out of tube 1. Further lifting of the float opens the large valve 10, spilling the contents of the float tank into the filter tank, whence the oil returns to the crankcase through the filter as described above. This cycle repeats itself automatically and continuously as long as the engine is running.

Under average conditions with average engine, according to makers of the aerator, the entire oil supply of the engine is carried through the device and subjected to the purifying process about four times per hour. The device is to be sold both for original equipment as well as to the replacement trade.

Special Bolts Offer Advantages in Automotive Industry

BOLTS and nuts have been standardized to quite an extent for a long time, both for general use and for use in specific lines of work; still, in automobile manufacture there are places where the standard designs are unsuitable and special bolts offer advantages. A collection of such special bolts supplied by the Buffalo Bolt Company of North Tonawanda, N. Y., to various automobile manufacturers is shown in the accompanying photograph.



Special bolts manufactured by Buffalo Bolt Co.

Fig. 1 shows a cut thread hub bolt, with an oval-shaped head and with a fluted or corrugated neck. The oval head used here is designed to conform with the general contour of the spoke, the section of which is expanded at the point of entry of the bolt for strengthening purposes. The corrugated neck is a feature incorporated only in the special bolts used on the more expensive makes of car, and serves to prevent twisting or turning of the bolt. Another advantage of this type neck over the square-head bolt is that it actually cuts its way into the wood, in place of displacing the material, as occurs with the latter. These changes in design materially add to the cost of manufacture. The oval-shaped head, for example, necessitates two operations in place of one for forming the head, while an annealing process is also added. These are followed by a trimming operation to remove the rough edges on the head. The corrugated neck is rolled on a die, and finally the end is turned or pointed and the thread cut with a revolving die.

Fig. 2 shows a type bolt requiring not only special operations, but also special machines. The head is tipped at an angle of 5 deg. to insure a perfect bearing on the inclined flange of the hub. The use here of the so-called "angle head" has eliminated automatic machines in the threading operations. In other words, each bolt of this kind must be threaded on a jobbing machine.

Fig. 3 shows a short-necked bolt with a standard S. A. E. cut thread, used for attaching the tail-light to the frame. Worth noting here is the fact that the head is smaller in diameter but heavier in weight than the standard head. The special long thread allows a close take-up onto the casting. In specifying this extra heavy head, which insures a rigid and firm tail-light connection to the frame, the automotive manufacturer has gone to added expense, as this type of head requires considerable more stock in manufacturing.

Fig. 4 illustrates much the same type bolt; here, however, it represents an attempt by the automotive manufacturer to obtain the maximum strength and rigidity in his hub bolt by incorporating an extra heavy head.

The next figure, 5, represents a type of rim bolt with a button head with one side tipped and the neck itself oval-shaped. The threads are cut. The tipping of one side of the head insures a full bearing surface for the tire rim which rests against it. The neck in the form of an oval prevents the bolt from turning. This type head requires the use of several special dies for tipping; the making of the oval neck, however, does not necessitate an extra operation of any kind, as it is formed in the forging operation and in the same heat.

Fig. 6 represents a less expensive type of rim bolt having a head with clipped sides. Clipping of the heads allows the tire rim to fit snugly on the wheel. Both sides are clipped to allow for speed in assembly. The clipping or trimming operation is necessarily special.

Dilution and Lubrication Problems Discussed at A. P. I. Meeting

Neil MacCoull predicts engines requiring no mechanical attention during 100,000 miles of operation. Petroleum industry suffers still from over-production. J. Edgar Pew is elected president.

UNDER average operating conditions crankcase oil dilution, (1) depends primarily on the average temperature of the cylinder walls, (2) is likely to reach an equilibrium value if starting periods are not too frequent, (3) depends directly on fuel volatility, (4) depends directly on the average fuel-air ratio, (5) is not greatly affected by the piston temperature, (6) does not depend much upon the charge temperature or the degree of vaporization.

These are among the important facts from an automotive standpoint which came to light as a result of reports made by representatives of the Bureau of Standards during the annual meeting of the American Petroleum Institute, held in Fort Worth, Tex., last week. They are the result of:

A comprehensive study of crankcase oil contamination which for some months has been the chief activity of the Bureau of Standards in connection with the cooperatitve fuel research program. H. C. Dickinson and S. W. Sparrow reported that the accomplishments of the past year include the development of a satisfactory method for measuring dilution, the formulation of a reasonable explanation of the mechanism of dilution and the collection of much additional information as to the factors that influence the rate of dilution.

If you are seeking to improve lubrication, consider the following:

Recent research has shown that oil dilution depends primarily on average temperature of cylinder walls, on fuel volatility and average fuel-air ratio but is not affected greatly by piston temperature, charge temperature or degree of vaporization of the fuel.

By-pass valves in conventional pressure lubricating systems often open too soon when the oil is cold and bearing clearances small. In consequence oil is not delivered to the bearings when much needed. Neil MacCoull recommends a constant volume system in which the same quantity of oil is delivered per revolution letting the pressure go where it will, instead of the constant pressure system now generally used.

"The right oil in the right place in the right quantity at the right time" will insure against wear.

"I look forward to the day when any *good* car can be expected to cover at least 100,000 miles with no mechanical attention to the engine," stated Neil MacCoull, Texas Co., in his paper on fuel utilization and lubrication. The possibility of great progress in research was said to make the future look very bright for securing low fuel and depreciation expenses for the owners of automotive vehicles.

"No Government meddling in the oil industry's ills!" was the prescription of Thomas O'Donnell, retiring president of the American Petroleum Institute, who made the opening address of the fifth annual meeting of the Institute held at Fort Worth, Tex., Dec. 9-11. Mr. O'Donnell was vigorous in his denunciation of the proposal that the Government should be called in to assist in alleviating "the temporary growing pains of over-production"; he believed that the industry should be left without molestation to work out its own salvation.

Henry L. Doherty, president, H. L. Doherty Co., did not agree with these views and asked that he be given an opportunity to explain his unit development plan for petroleum conservation before the institute. It was found impossible, however, to rearrange the program to this extent and with the concurrence of Mr. Doherty the discussion was postponed.

J. Edward Pew of the Sun Oil Co. was elected president of the Institute to succeed Mr. O'Donnell, who has occupied that office since the formation of the organization about five years ago.

These are among the high spots of the fifth annual meeting of the A. P. I. as viewed from the standpoint of an automotive observer.

In leading up to the subject of fuel utilization Mr. MacCoull called attention to the fact that the price of gasoline always must depend upon the quantity obtainable from a barrel of crude. He recalled how the development of the cracking process and the practice of cutting deeper into the crude have increased the yield to a marked degree during the past three years.

Speaking of detonation, Mr. MacCoull said in part, "There is a possibility of refining a straight fuel which, because of its inherent composition, will allow higher engine compressions. Injection of water or steam into the combustion chamber has a pronounced effect in suppressing detonation, though large volumes are necessary. For example, equal suppression of detonation will result from 30 per cent water, 12 per cent benzol or 0.05 per cent tetra-ethyl lead."

Turning to the subject of lubrication, the speaker emphasized the need for getting "the right oil in the right quantity to the right place at the right time." He pointed out cases in which this is not accomplished. In discussing full pressure lubricating systems he called attention to the weaknesses of the spring loaded regulating valve.

He said, in part, "When the oil is cold a very high pressure is necessary to force the normal volume of oil through the bearings. But before the pump can build up such a pressure the by-pass valve opens and releases most of the oil back into the crankcase. Consequently,

while the oil is cold, very little passes through the bearings and naturally very much less reaches the cylinder than normally.

"I cannot see why a more or less constant pressure should be sought after instead of a constant volume per revolution. Let the oil pump act like a meter, make it the right size and let the pressure required to deliver that volume go where it will. If adjustment of the rate of circulation is needed for varying piston-ring fits, this can be done nicely by the use of an open orifice in place of the spring-loaded valve.

"Why should not an engine be designed around an oil which should be used rather than to try to find an oil to suit an engine after it is built? In other words, isn't it feasible to adapt an engine to any desired oil by proper regulation of the rate of oil circulation to secure a normal oil consumption? By this means, it should at least be possible to eliminate the necessity for using oils of such high velocity that they are too sluggish to flow in a cold engine, and that usually leave large carbon deposits."

" 'Power availability' is undoubtedly the principal factor upon which the motor vehicle operator bases his conclusions regarding the degree of acceptability of a fuel," asserted J. A. C. Warner, S. A. E. Research Manager, in his paper "Automotive Fuel Observations." To bear out this statement the speaker presented evidence from the cooperative winter road tests of fuels, in which ten leading automobile companies participated.

Drivers Agree

In reporting on the driving characteristics of the four fuels tested, the drivers were in close agreement as to the choice of fuels. The order of preference followed the order of fuel volatilities in the 14 to 20 per cent range of the distillation curves. Small temperature differences in this range apparently had an important effect upon the power availability—acceleration or get-away, that exerted such a great influence in determining the order of preference.

Mr. Warner included in his paper additional material leading to the following conclusions:

(*a*) In the matter of dilution, which apparently is influenced largely by the upper part of the distillation range, the average motor vehicle operator has no effective and ready means of warning of impending difficulties that may arise from excessive dilution. Thus he is largely at the mercy of the fuel supplier in this regard.

(*b*) Dirt and dilution go hand-in-hand throughout the general problem of oil contamination. Both factors must be given due consideration.

(*c*) Sufficient evidence has been gathered by the Fuels Group of the S. A. E. Research Committee to indicate the desirability of devoting added attention to the question of permissible sulphur content of motor fuels.

(*d*) Bureau of Standards tests have shown that none of the fuel dopes or doped fuels thus far studied has produced any appreciable improvement in power or fuel consumption, provided no detonation was present when using the untreated gasoline. Dopes that are beneficial derive their value from their influence upon detonation.

(*e*) Bureau of Standards tests have shown that influence of running an engine under load is marked insofar as the removal of carbon deposits is concerned.

(*f*) Outstanding fuel problems are of common interest to the automotive and petroleum engineers alike, and best can be handled through concerted effort. The primary object should be that of maintaining a proper balance between the automotive equipment and the fuel available.

One of the most interesting developments of the cooperative fuel research work at the Bureau of Standards is the new vacuum distillation transition method for measuring crankcase oil dilution. Briefly, the method consists of the distillation under vacuum of a sample of diluted oil. It is assumed that there is an abrupt change in the properties of the hydrocarbon compounds as one proceeds from the diluent to the oil.

Thus, if the amounts distilled are plotted against temperature the curve will change its slope abruptly as the distillation passes from the diluent to the oil, that is, in the transition region. It is possible to select from this curve the value that represents very accurately the percentage dilution of the sample under test.

The transition method is said to possess the following advantages: (1) a knowledge of the oil or fuel used in the engine from which the used sample is drawn is not necessary, (2) no cracking or decomposition of the oil takes place during the test, (3) the time required is only about 15 min., (4) the evaluation of the result is not influenced appreciably by personal judgment, (5) measurements of actual vapor temperature are not essential since it is the change in temperature rather than the temperature itself that is of interest, (6) the accuracy of the test is not affected by moderate changes in procedure, (7) the method is rational rather than empirical, (8) the accuracy is adequate for all present needs.

Convention Discusses Progress in Electroplating

PAPERS presented at a conference of electroplaters recently held at the Bureau of Standards covered the progress which has been made in the bureau's laboratories in connection with electroplating research as well as the experience of those engaged in the commercial application of the subject. Valuable suggestions were made as to the lines along which future research can most profitably be directed.

C. T. Thomas of the bureau's staff presented a paper covering the protective value of nickel deposits. This was illustrated by exhibits of specimens which had been plated with nickel and then subjected to various corrosive agencies. In the present state of the art, it was brought out, the protection afforded by nickel plating is far from complete, and it does not seem likely that any single discovery will solve the problem once for all. It will be a matter of slow improvement in plating methods as the result of increasing scientific knowledge of the process of electroplating and of the numerous variables that affect it.

M. R. Thomas, also of the bureau's staff, described the studies now in progress in connection with the nickel plating of zinc and die castings. This is an important matter because of the increasing use of die castings for automobile trimmings and other nickel plated objects which were formerly made of brass. The metals used for making such parts are largely alloys containing zinc, and are cast in steel molds which can be used over and over.

Other researches in progress at the bureau were discussed, including studies of nickel anodes, the effect of impurities in nickel salts, measurements of the hydrogen iron concentration, and the throwing power of nickel-plating solutions. The ideal solution would be one that would give an even deposit all over, and this is still far from being attained. It is now possible, however, to make a solution which will give much better distribution of nickel than could be obtained a few years ago.

Here and There in Foreign Markets

By special arrangement with the Automotive Division, Bureau of Foreign and Domestic Commerce

Japanese Buying

AMERICAN exporters of automobiles and trucks into Japan are securing approximately one-half of the business of that country. August imports of cars and trucks through the Port of Tokyo were 98, of which 49 came from the United States, Canada ranking second with 33. Stocks of American passenger cars on hand are small and most dealers who are receiving 1925 models report a moderate business in both open and closed cars. The truck market is reported as stagnant.

Building Bodies in Australia

THE ratio of automobile bodies built in Australia to the number of passenger cars and trucks sold in that country has grown to approximately 80 per cent. Of the automobile body building plants in that country, unquestionably the largest is the Holden's Motor Body Builders, Ltd., at Adelaide, which manufactures annually 25,000 bodies. It is readily seen that manufacturers of parts which go into the construction of automobile bodies can secure a good business through the sale in that country of bow sockets, carpets, imitation leather, curled hair, paint, etc.

Union of South Africa Figures

THE total number of motor vehicles licensed in Natal in 1923 was 9126, of which 5624 were motor cars, 3003 motorcycles and 499 lorries, vans and taxis. Approximately 15 per cent of the motor cars in the Union were in use in Natal. Although American cars are strongly in this market, there is ample competition, as shown by the fact that sixteen makes of foreign cars are represented in Durban.

German Tariff Changes

HERETOFORE the powerful influence of the German automobile industry over the Government has been evidenced by the rigid system of licensing, which has reduced the sales of American cars to a minimum. It is now possible, however, that the combined influence of the dealers, who are almost unanimously in favor of permitting foreign imports, and of a part of the consuming class, notably agriculture, may result in a reasonable tariff duty, apart from the efforts which other automobile exporting countries will doubtless make to obtain a low rate. Although the adoption of new duties on automobiles and other products is now delayed by the absence of a Reichstag, the economic council has approved partial tariff revisions, almost exclusively upward, and it is possible though not probable that new rates which affect automobiles will be provisionally adopted before the new Reichstag approves. The Reichstag is scheduled to meet shortly after the election Dec. 7.

Light Cars Increasing in China

THE light car in the Shanghai district has increased in popularity during the past six months. The imports for the first nine months of this year were 921, against 752 for the first nine months of 1923. In the matter of increasing business, however, American manufacturers are not gaining as fast as those of some other countries. The figures show that so far this year the United States has shipped 580 cars, compared to 521 last year for the same period, while the French manufacturers' exports increased from 87 to 126 and British manufacturers' business increased from 47 to 143. Italy and Germany's light motor exports this year fell off almost entirely, the former's from 25 to 4 this year and Germany's from 72 to 6 for the nine-months period.

Paraguay Offers Future Market

POOR roads offer a serious handicap against the extensive use of automobiles in Paraguay. However, the future will undoubtedly favor the importation of motor vehicles should the plan of the National Department of Engineers materialize. This plan includes paved streets in Asuncion and the construction of roads between the important concentration centers of agriculture. According to the Municipality of Asuncion, there are only 198 automobiles and seven trucks at present in operation in the capital and about 80 automobiles and two trucks in the interior, all of which are of American origin.

Denmark Takes Automobile Census

A CENSUS of the automotive vehicles in use in Denmark, just completed, shows that at the present time there are in use 15,000 passenger cars, 5000 trucks and 5600 motorcycles. The figures represent an average increase of 600 per cent over the census of 1919. American cars predominate, with the French Citroen, the small Italian Fiat and the English Austin, Rover and Lagonda offering the chief foreign competition.

Duties Reduced in Jerusalem

THE Customs Duties Amendment Ordinance at Jerusalem for 1924, published August 15 and effective August 18, establishes new import duties of 8 per cent ad valorem on bicycles, motorcycles, trucks, carts, automobiles, tires and accessories, instead of the uniform 11 per cent formerly collected.

The FORUM

Balancing Four-Cylinder Engines by Bob Weight on Connecting Rod Cap

Editor, AUTOMOTIVE INDUSTRIES:

Referring to the article in AUTOMOTIVE INDUSTRIES of Oct. 23, mentioning the 14-40 Vauxhall motor, "Balanced by means of bob weights attached to the big end bearing caps, thereby bringing the center of gravity very near that of the crank pin," and the Editor's note, "It is hard to see how such weights can have this effect," please consider the following:

A given point, say the center of gravity of the bob weight only, does not travel in a true circle, as does the crank pin, but the path of its travel forms an ellipse and the distance traveled by this point is not the same for each of a number of equal arcs of the circle of crank travel but is greater at the top and bottom of the stroke. This holds, also, for a similar point in the bob weight of the connecting rod on the opposite crank throw, thus doubling this unbalance.

It is true that any point on the connecting rod between the crank pin and the piston pin also travels in an ellipse, having its long diameter perpendicular to the long diameter of the ellipse described by the bob weight. Possibly the elliptical travel of the weight occurring in this manner tends to harmonize that of the connecting rod.

Also, on account of the higher speed of the given point of the bob weight occurring at the time when there is the greatest ratio between the distances traveled by the descending and ascending pistons, due to the principle of connecting rod angularity, is it not possible that this varying speed of the bob weights does set up an unbalanced force that counteracts or dampens out the inherent vibration in a four-cylinder motor?

Please give your opinion and, if there are any facts in the above assumptions, I would like to see expressed the method of ascertaining mathematically the proper weight and length of bob weights for a four-cylinder engine of a given stroke, connecting rod length and reciprocating weight.

H. R. JOHNSON.

There is no doubt that bob weights attached to the connecting rod caps of four-cylinder engines can be made to balance the unbalanced forces of the reciprocating parts. This can easily be shown graphically. We know that in a four-cylinder engine of orthodox design the primary inertia forces are inherently balanced and only the secondary components remain to cause vibration. These secondary inertia forces are due to the fact that the pistons travel faster during the first quarter of the crank revolution from the top dead center position than during the second quarter. The reason for this is the angularity of the connecting rod, as is clearly shown in the diagram Fig. 1. Here *A* denotes the half stroke point and *B* the actual position of the piston at the quarter position of the crank. As the piston completed more than one-half of the stroke while the crank described a quarter revolution, and as it will complete a full stroke during a half revolution, it is obvious that it travels faster during the first than during the second quarter of the crank revolution. Similarly, it travels faster during the fourth than during the third quarter.

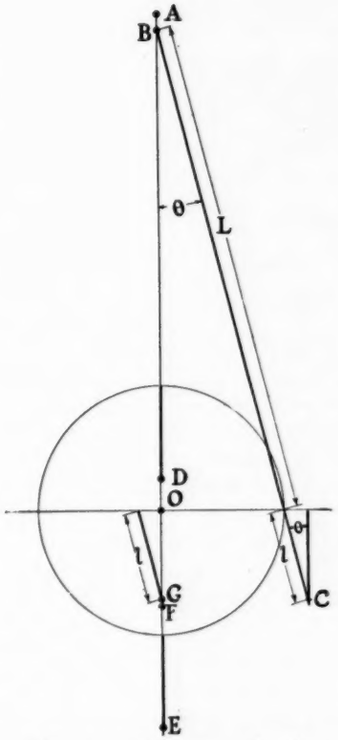


Fig. 1 — Diagram showing bob weight in various positions

The mass of the bob weight may be considered as centered at *C*, at a distance *l* from the axis of the crankpin. We will consider only the vertical component of the motion of this weight. When the crank is in the top dead center position the bob weight is in position *D*, but when the crank is in the bottom dead center position the bob weight is in position *E*, while *F* represents a point midway between *D* and *E*. However, at the end of the first quarter revolution the bob is not down as low as *F* but only as far down as *G*. In other words, the vertical motion of the bob weight is less during the first quarter revolution than during the second, whereas the motion of the pistons and other reciprocating parts is greater during the first than during the second quarter revolution.

Referring to the diagram,

$$GF = OF - OG = l - l\cos\theta.$$

Similarly

$$AB = AO - BO = L - L\cos\theta.$$

The bob weight may therefore be regarded as subject to a negative secondary inertia force which may balance the secondary inertia force of the reciprocating parts.

Let w be the weight of the reciprocating parts and W the weight of the bob. Then, since the motion of the reciprocating parts due to the angularity of the connecting rod during the first quarter revolution is $L - L\cos\theta$, and the vertical motion of the bob weight during the same period and due to the same cause is $-(l - l\cos\theta)$ in order that the positive and negative secondary inertia forces may balance, we must have the following:

$w\ (L - L\cos\Theta) = W\ (l - l\cos\Theta)$ or $W = wL \div l$

Stated in non-mathematical language, the bob weight must be as many times the reciprocating weight as the connecting rod length is times the distance of the center of gravity of the bob weight from the crankpin axis.

The bob weight, of course, represents chiefly rotating weight and would add enormously to the centrifugal force, which must be transmitted through the connecting rod bearing to the crankshaft, and either be balanced by weights on the crank-arms or else also taken on the crankshaft main bearings.

In practice the bob weight radius could hardly be made more than one-third the connecting rod length, which would mean that the bob would have to be three times the weight of the reciprocating parts, including the piston, piston pin, rings, bushings and top half of the connecting rod, and it does not seem practical to place such a large weight on the connecting rod head, in view of the tremendous centrifugal force which this would give rise to at high engine speeds.

In calculating the weight or moment required to balance the bob weight, the largest distance of the center of gravity of this weight from the crankshaft axis must be figured with as the axis of rotation. In the dead center positions of the crank the bob weight, of course, is nearer the crankshaft axis, and this is the reason for the negative inertia force referred to in the foregoing. EDITOR.

Cold Weather Starting Aids

Editor, AUTOMOTIVE INDUSTRIES:

Regarding Mr. Heldt's article on Gasoline Preheating Devices in your issue of Nov. 27, it seems as if devices described act more as a slight alleviation than as a cure for oil dilution and cylinder rusting troubles, as:

1. All devices described are fitted with a choke or other means of enriching the mixture during starting so that heavy end fuel is forced into the cylinders in contact with lubricating oil, and so into the crankcase.

2. No automatic means are provided to put the choke out of operation as normal operation takes place, so that it is possible to run an engine for some time with the choke in full or partial operation, thus providing gasoline for crankcase dilution.

3. No provision is made for gasoline condensed out of the gas entering the cylinder caused by the change in vapor pressure on compressing in a cold cylinder.

4. Jardine has shown that the only way to prevent the rusting out of cylinders and the scuffing of pistons is to haye the jacket hot when the engine is stopped. The rusting of cold iron surfaces in a damp atmosphere has long been known and is recognized by the builders of large double-acting gas engines, who are always very careful to pass the cooling water through the heads before forcing it through the piston rods to prevent sweating and consequent rusting and rapid wear.

The stopping of an engine with hot cylinders, thereby leaving a film of oil on the rubbing surfaces and reducing friction, instead of asking the starter to force the pistons over rusted and water washed surfaces would have more effect on easy starting than heating the fuel before it enters the cold cylinders, where it is at least partially chilled before ignition can take place.

It is now standard practice of all large operating companies to remove all carbureter choking devices from the driver's control, their experience having shown this to be absolutely necessary.

As it is impossible to prevent dilution when starting cold, the real solution of the problem is to provide means to bring the engine to operating temperature in the shortest possible time and to maintain the crankcase always at or near the boiling point of water, so that all of the water and the greater part of the fuel entering during the short starting period will quickly be driven off.

If these conditions are met it can be shown that there is no water and the amount of fuel dilution will be as slight as where an external distilling apparatus is used.

A. G. HERRESHOFF,
Chief Engineer, Rushmore Laboratory.

(The article in question dealt more particularly with means to facilitate starting, as distinguished from means designed to raise the engine quickly to the normal working temperature.—Editor.)

Surface Tension a Factor in Lubrication

Editor, AUTOMOTIVE INDUSTRIES:

In Mr. Jardine's paper on scuffed pistons, the evidence seems to point to the fact that the anti-friction properties of mineral oils are inferior to those of castor oil when lubrication consists of oil content rather than of a supporting film. The superiority of animal and vegetable oils in wetting the metallic surfaces, which is recognized in the preparation of cutting oils for screw-machine operation, is conceded to be due to small quantities of free fatty acids. These acids lower the surface tension of the oil with respect to the metal, facilitate the wetting of the metal, and thus permit more intimate contact between the oil and the metallic surface.

The theory that surface tension of the oil is a factor in piston lubrication is substantiated by the marked improvement observed on raising the temperature of the cylinder wall. Whereas a cold cylinder destroyed the lubricating qualities of the oil, heating the cylinder lowered the surface tension of the oil and caused such close contact between the oil and metal that a single application of oil sufficed for 15 minutes of full load operation. In a later test the presence of water on the cylinder wall prevented the wetting of the metal by the oil and resulted in scuffing.

A study of the corrosion of cold metals coated with mineral oils containing small percentages of animal and vegetable oils might throw some light upon the subject of interfacial contact between the metal and the oil. The development of a mineral oil to function at low as well as at high temperatures seems to be a necessity in view of the extensive use of automobiles in cold weather.

H. A. HUEBOTTER,
Engineering Experiment Station, Purdue University.

IN the article entitled "Scuffed Pistons and Oil Dilution Reduced by Gasoline Preheating Devices" there occurred a mistake in the calculation of the partial pressure of the gasoline vapor in the fuel mixture. This partial pressure is proportional to the relative volume of the fuel vapor and not to its relative weight. Assuming, for instance, that it is proposed to feed (for starting) sufficient fuel so that only constituents having a volatility not less than that of hexane need to be vaporized in order to obtain a theoretically correct combustible mixture, the volume ratio of air and gasoline vapor will be 46 to 1, so that the fuel vapor will occupy one-forty-seventh of the total volume. Hence the partial pressure of the fuel vapor (with the assumed total pressure of 11.8 lb. per sq. in.) will be 11.8/47 = 0.25 lb. (= 12 mm. of mercury). Hexane has a vapor pressure equal to 12 mm. of mercury at about 10 deg. below zero. It has a boiling point of 155 deg. Fahr. and the proportion of present day motor gasoline having a volatility not less than it is only very small. It is thus seen that a combustible mixture can be formed at a temperature of 10 deg. below zero if sufficient fuel is fed.

EDITORIAL

The New Record

WITH France recapturing the world's airplane speed record, it seems likely that the next Pulitzer race will develop into a real international contest, since there is good reason to believe that both British and French pilots will compete.

In bettering the American record of 266 m.p.h., the French pilot used a plane whose motor develops approximately 70 hp. less than the record holding American machine. Consequently if the French entries appear at the Pulitzer races next year, it seems certain that they will give the American pilots a good run for their money.

France is making a determined effort to capture the fourteen leading airplane records America now holds.

The winner of this year's Pulitzer race was over three years old. New machines and new designs will be necessary if America is to hold its speed supremacy in the air.

Christmas—and Afterward

SENTIMENT finds such a small place in business that when we try to give expression to it the words sound hollow, though they come from the heart. And so it it that when we wish our readers a Merry Christmas and a New Year filled with those things which make life worth while we can only hope that the message will be received in the spirit in which it is sent.

The Christmas season is one in which we should and frequently do get a great amount of satisfaction out of doing something for or just remembering the other fellow, while often the smallest thing done brings an extraordinary amount of satisfaction both to him who gives and to him who receives.

Undoubtedly if we had more such sentiment in business as well as in other daily relations, we should profit proportionately the year around. Certain it is that consideration for the other fellow never hurts anybody and often helps immeasurably.

Economics Replacing Politics

THE business men of the world seem likely in the next few years to play a more important part in adjustment of international affairs than ever before. It is a well known fact that the adoption of the Dawes plan was made possible very largely by the work and approval of international business interests. Further efforts along this line are contemplated in the world economic survey being made by the International Chamber of Commerce preliminary to its Brussels meeting next year.

The automotive industry has a particular interest in the promotion of amity between nations and in the development of good-will among the business men of various countries. The use of automobiles is in its infancy in most foreign countries and the growth of international understanding cannot help but improve car and truck sales abroad.

Roy D. Chapin, the automotive representative on the committee which is to make the world economic survey mentioned, is a strong believer in the idea that good-will between nations will be materially assisted by the establishment of better contacts between the business men of the world. In his efforts to promote such contacts he should have the hearty support of the entire industry.

Internal Combustion Engines Increase

RECENT news items from abroad bear testimony to the rapid increase in the use of internal combustion engines in the older forms of transportation. This subject is of interest to the automotive industry chiefly on account of its bearing on the fuel problem, for although the engines used in the majority of applications are Diesel engines, which burn a fuel that is entirely unsuitable for automotive engines, this fuel, or at least a great proportion of it, could be converted into automotive engine fuel by cracking.

In the latest issue to hand of *The Engineer* of London there is a description of a Diesel-Electric locomotive built in Germany for the Russian state railways. At a recent railroad equipment exhibition at Seddin, Germany, there were exhibited eight different designs of oil-engined locomotives and fourteen motor railcars. Of the ship tonnage now under construction in Germany more than one-half is in motor-ships.

In other European countries the trend with respect to marine and railroad power is similar, and the prospects are that before another decade rolls around motor propulsion will be an important factor in both merchant marine and railroad work.

PHYSICAL and mechanical safeguards, punitive measures, strictly enforced; and traffic regulation seem to be the chief agencies upon which we will have to rely for the most far-reaching effects in reducing highway accidents. Education undoubtedly is a big help all along the line, but it looks as though its greatest service will be rendered as an assistant rather than as a principal.

This idea coincides with the opinion held by one of the men chiefly responsible for calling the National Conference on Street and Highway Safety which developed a lot of constructive suggestions in Washington this week. The recommendations of the conference, as well, seem to carry out the idea in a general way, although they embody definite educational suggestions.

Our Industry Today—

Manufacturers Start Replenishing Stocks of Parts and Accessories Sooner Than Expected—An Active First Quarter Indicated

NEW YORK, Dec. 15—A start has been made by automobile producers to replenish stocks of parts and accessories which have been held down to a minimum since the decline in sales and production set in. The volume of orders placed so far indicates an active manufacturing first quarter on the part of passenger car builders and an immediate pick-up among parts makers. The move toward replenishing stocks has come earlier in the month than was anticipated.

Reports from automotive jobbers are encouraging, November showing a 10 per cent increase over the corresponding month of last year. Healthy gains are shown among the jobbing houses identified with agricultural trade. December is not expected to break records in this merchandising branch of the industry, but it will establish good marks. Dealers are reported to be buying cautiously, stocks are low, production is restricted to meet demand and there is a growing feeling that a shortage of stocks among dealers will exist when the real spurt in buying comes.

Definite Program Early in 1925

Definite programs for automobile production next year will be settled upon following the opening of the show season in New York the first part of January. The New York show will give an indication of the demand producers may expect for the first quarter at least, not only from the extent of retail buying, but from the orders placed by visiting dealers included in the metropolitan area.

Although manufacturers regard the first quarter of next year with great optimism, they will not attempt to gage demand until concrete evidence is given of its probable extent. December will see a cessation of operations among some of the producers for a few days around the holidays to permit of plant overhauling and to pave the way for larger operations in 1925, so that the output for the month is likely to fall below that reported in November. Such a drop is normal to the season and follows the usual production curve. There will be no effort this month to step up schedules.

Tire Makers Active

Among the tire makers appears increased activity in preparation for large business in 1925. Some of the major producers are completing factory extensions, and others are gearing up their present facilities to capacity. Replacement business is expected to form a substantial part of the sales next year, although a large part of the output will be absorbed by motor vehicle makers for new equipment.

Highway Conference Adopts Safety Plans

Recommendations of Washington Gathering Cover a Wide Range of Subjects

WASHINGTON, Dec. 17—Formation of a permanent joint committee of all agencies interested in promotion of traffic safety, enunciation of broad principles, generally agreed upon, for making the highways safer, and concrete suggestions to motor vehicle manufacturers as regards car design, were the chief developments of the National Conference on Street and Highway Safety, which met here Dec. 15 and 16.

The gathering, which was called together by Secretary of Commerce Herbert Hoover, comprised representatives of the automobile industry, the railroads, the insurance companies, safety organizations, chambers of commerce, motor vehicle commissioners, women's clubs and other agencies of a similar character.

The recommendations adopted by the conference, while general in character, covered a wide range of subjects and, as finally adopted, met with the entire approval of the automotive representatives. Suggestions as regards motor vehicle design were incorporated in the final recommendations substantially as they had been outlined in the preliminary report made by the Committee on the Motor Vehicle, of which Henry M. Crane, president of the Society of Automotive Engineers, was chairman. They urge among other things:

1. Service brakes capable of stopping the vehicle in a distance of not more than 50 ft. from a speed of 20 m.p.h. on a dry, smooth, hard-surfaced road free from any loose material; and emergency brakes capable of holding the vehicle on any grade which the vehicle can ascend.

2. More rigid enforcement of lighting regulations and further study of the problem of headlight glare and road illumination.

3. Limitation of overall width of "body, chassis or load of any motor vehicle to 96 in."

Proposals to insert in the conference report recommendations favoring compulsory automobile insurance and unlimited endorsement of regulations providing that vehicles must come to a full stop before going over grade crossings were defeated on the floor.

By refusing to insert the compulsory insurance proposal, the conference simply refrained from expressing any opinion on this point.

A modified suggestion as regards the full stop law was approved unanimously when George N. Graham, speaking for the automotive group, endorsed it after considerable debate had taken place among representatives of other groups in the conference. The modified resolution reads:

"Properly designated State commissions should be empowered to designate dangerous grade crossings at which motorists must stop."

It was decided to hold a similar conference about one year hence. Mr. Hoover appointed the members of the Steering Committee — who had been chosen the previous day by the various groups—to act as a permanent joint committee. The Public Relations Committee, of which Mr. Graham is chairman, is to continue to function as well.

In opening the conference Mr. Hoover emphasized the fact that he did not desire the formation of any new organization and that he does not believe that centralized control can be the means of solving the highway safety problem. This view was confirmed by President Coolidge, who addressed the conference briefly on Tuesday afternoon and gave his hearty endorsement to its purpose and activities.

Detroit Motor Valve Company Name Changed

DETROIT, Dec. 15—The name of the Detroit Motor Valve Co. will be changed to the James Motor Valve Co., effective Jan. 1. The change in name is brought about by the desire of directors to connect more closely the name of the company with its trademarked product. This connection is regarded as especially desirable from a merchandising point of view. No other change will be made in company policy, according to John H. James, president.

Sales of the company in the replacement field showed a very large increase in the present year, a gain of about 300 per cent being registered over 1923.

Plan Reorganization of Hydraulic Steel

Formation of New Company to Follow Successful Operation by Receiver

CLEVELAND, Dec. 16—Plans are going forward here for a reorganization of the Hydraulic Pressed Steel Co., manufacturer of automobile frames. It is understood that bondholders and preferred stockholders have been encouraged by the showings of the company and have agreed upon a reorganization under the management of several manufacturers of railroad supplies in the Chicago district.

The plan of reorganization provides for a new company which would issue $1,000,000 first mortgage 7 per cent bonds and $4,000,000 income 7 per cent bonds, the proceeds from the latter issue to be used to take care of creditors and noteholders. There would be about 100,000 shares of no par common. Everything above the promoters' and managers' portion of this issue would be divided 75 per cent among present preferred stockholders and 25 per cent among creditors and noteholders.

The Hydraulic Pressed Steel Co., one of the largest manufacturing establishments in Cleveland, has been in the hands of a receiver since a year ago last October. Economic management of the receiver has yielded a net profit of $281,291 for the year ending Oct. 31. A contract to supply automobile frames is reported to have been signed recently with the Willys-Overland Co. from which substantial results are expected.

Working Capital $673,859

The company's balance sheet as of Oct. 31, 1924, shows total current assets of $1,867,914 and current liabilities of $1,194,055. As compared with the previous year they are as follows:

CURRENT ASSETS	Oct.31,1924	Oct.27,1923
Cash	$ 277,219	$ 149,715
U. S. Securities	249,137	.....
Notes and Accounts Receivable	31,650	75,018
Commercial Credit Co. Account	.....	107,023
Other Cust. Accounts	428,862	216,321
Inventory	881,046	1,220,301
Total	$1,867,914	$1,768,378
CURRENT LIABILITIES		
Notes Payable	$ 278,221	$ 295,082
Accounts Payable	443,753	450,602
Accruals	472,081	400,744
Total	$1,194,055	$1,146,428
Net Working Capital	$ 673,859	$ 621,950

Fordson Front Wheels Changed

DETROIT, Dec. 17—Due to the general use of rubber tired wheels on Fordson tractors in industrial work, the amount of toe-in on the front wheels has been decreased to reduce tire wear. This change has been effected by reducing the length of the tie-rod from 37⅞ to 37 21/32 in. With the new tie-rod the front wheel rims are ¼ in. closer together than at the rear, instead of 1¼ in., as formerly.

Business in Brief

Written exclusively for AUTOMOTIVE INDUSTRIES *by the Guaranty Trust Co., second largest bank in America.*

NEW YORK, Dec. 17—The stock market witnessed last week the first important reaction since the election. This was only temporary, however. Slight recessions were noted in commodity prices and in some lines of trade in which unseasonably warm weather has been a factor. Holiday buying as a whole, however, promises to be very large, and the general tone of optimism is unchanged.

The largest monthly gain in more than two years is shown in the report of unfilled orders of the United States Steel Corp. The total on Nov. 30 was 4,031,969 tons, which compares with 3,525,270 tons at the end of October and 4,368,584 tons on Nov. 30, 1923.

A new seasonal record in car loadings was made in the week ended Dec. 6, when the total was 968,256 cars, as against 878,631 in the preceding week and 913,921 in the corresponding period last year. Railroad traffic reached the highest point in its history in October with an aggregate movement of 43,109,743,000 net ton miles, exceeding by 2.1 per cent the figure for October last year and by 1 per cent the previous high record of August, 1920.

Foreign trade continued active last month, with exports of $494,000,000 and imports of $296,000,000, as compared with exports of $527,000,000 and imports of $310,000,000 in October and exports of $400,000,000 and imports of $291,000,000 in November last year. The export balance of $198,000,000 compares with $216,000,000 in the preceding month and $109,000,000 a year ago.

The production of crude petroleum was slightly lower in the week ended Dec. 6, with a daily average of 1,974,800 barrels to compare with 1,975,800 in the preceding week and 2,006,150 in the corresponding period last year.

Fisher's index of wholesale commodity prices stood at 153.7 last week, as against 154.6 for the preceding week and 154.4 two weeks earlier. The level of wholesale prices in November, as reported by the Bureau of Labor Statistics, was one-half of one per cent higher than in October.

M. A. M. A. Establishes a Foreign Service

Information About Credit of Buyers Abroad Will Be Supplied Members

NEW YORK, Dec. 15—An important extension of its credit work is announced by the Motor and Accessory Manufacturers Association in the establishment of a foreign credit service which will obtain and circulate among the members of the association information relative to the credit standing of foreign buyers or prospective foreign buyers. This service will augment the present domestic work and will be in charge of A. H. Fagan, manager of the credit department of the M. A. M. A.

The information will cover the foreign field thoroughly and will furnish data relative to all buyers overseas of parts and accessories produced in this country. It will be gathered through the interchange of information in the hands of the various export members of the M. A. M. A. with the cooperation of export houses and banks.

Distribution of the data gathered will be along the lines followed in disseminating facts concerning domestic credits. This includes the sending out of special and general bulletins.

Bates Bondholders Take Over Plant Operation

JOLIET, ILL., Dec. 17—Bondholders of the Bates Machine & Tractor Co. have taken over the operation of the plant under negotiations completed last week and the receiver appointed some months ago has been relieved. W. O. Bates, head of the company, in a statement announcing the action said:

The affairs of the Bates Machine and Tractor Co. were removed from the hands of the trustee today when the bondholders for the company entered into an agreement to pay a stipulated sum to wipe out the liabilities. This move marks the first step in a reorganization program which, it is understood, has been contemplated for the past few months.

The Bates Machine Co. for over 41 years has been one of Joliet's steady industries, contributing to the community's income each year over $200,000 paid out in Joliet for labor alone. It was established here in 1883 by W. O. Bates and his brother, A. J. Bates, and has operated steadily since that time, until it was embarrassed by the agricultural depression last spring, when it was thrown into the hands of a trustee, although its assets were listed as $1,650,140 and liabilities $566,000.

It is expected that the company will resume operations in the next few weeks, manufacturing a line of road tractors.

Bendix and Perrot Merged in Chicago

A $3,000,000 Corporation Is Organized to Take Over the Two Companies

CHICAGO, Dec. 16—A $3,000,000 corporation to control the rights to the patents of the Bendix drive and of the Bendix Perrot control for the Bendix four-wheel brake has been formed through the merger of the Perrot Brake Corp. and the Bendix Engineering Works into the Bendix Corp., with headquarters in this city. The Perrot Brake Corp. heretofore has controlled American rights to the Perrot patents and the Bendix Engineering Works has controlled the patent rights of the Bendix drive. Vincent Bendix, originator and patentee of the Bendix drive, will be president of the new corporation and J. L. Price, formerly vice-president of the Chicago Pneumatic Tool Co., will be vice-president and general manager.

The Bendix four-wheel brake will be manufactured by the Bendix Brake Co. of South Bend, a subsidiary company to the Bendix Corp. Manufacturing facilities at the South Bend plant will be greatly increased.

G. M. Deliveries Reach 34,388 in November

NEW YORK, Dec. 17—Deliveries of General Motors vehicles by dealers to ultimate consumers in November totaled 34,388 cars and trucks, compared with 47,009 in the same month a year ago and with 46,003 in October of this year.

From Jan. 1 to the end of November there were delivered 623,695 General Motors cars and trucks by dealers to ultimate users, compared with 693,319 in the corresponding period of last year, a decrease of 10 per cent.

The following tabulation shows sales of General Motors cars by dealers to ultimate consumers, as well as sales by manufacturing divisions of General Motors to their dealers:

	1924		1923	
	Sales to Users by Dealers	Sales by G.M.C. to Dealers	Sales to Users by Dealers	Sales by G.M.C. to Dealers
Jan.	33,395	61,398	30,464	49,162
Feb.	50,008	78,668	41,448	55,427
Mar.	55,845	75,484	74,137	71,669
Apr.	89,610	58,600	97,667	75,822
May	84,686	45,965	89,317	75,393
June	66,146	32,984	75,952	69,708
July	60,275	40,563	63,209	51,634
Aug.	54,871	48,614	55,832	65,999
Sept.	48,568	51,955	60,111	69,081
Oct.	46,003	49,552	58,173	86,936
Nov.	*34,388	*24,750	47,009	66,256
Total	623,695	568,533	693,319	737,087

*These preliminary figures include Buick, Cadillac, Chevrolet, Oakland, Oldsmobile passenger and commercial cars and GMC trucks sold in the United States, Canada and overseas.

GARY TRUSTEE REPORTS

FRANKFORT, IND., Dec. 17—Charles L. Surprise, trustee in the involuntary bankruptcy case of the Gary Motor Truck Co., has filed a report showing that he has collected $121,698, that he has paid out $110,985, that there remains in his hands $10,712 and that the purchaser has paid, in addition to the agreed amount, $1,904 to cover its portion of expenses incurred as a result of delay in paying the balance due under the terms of the sale. He asks for a total allowance of $2,703. The report is to be heard by the referee here Dec. 22.

A. E. A. MAKES READY FOR COST RESEARCH

CHICAGO, Dec. 17—At a meeting of the Merchandising Committee of the Automotive Equipment Association here arrangements were completed for a second survey of the cost of doing business in the automotive jobbing field by the Bureau of Business Research of the Harvard University.

A preliminary survey made by the Harvard bureau last year was analyzed and presented before the Automotive Equipment Association at its spring meeting last April in New Orleans.

This survey, while pointing out many interesting facts about the automotive jobbing business, was not considered conclusive enough, because of the great divergence in methods of bookkeeping and accounting by the various jobber members of the association.

Says Automobile Helps the Implement Dealers

PEORIA, ILL., Dec. 15—Implement dealers and manufacturers for the first time in several years will be on the right side of the ledger at the close of 1925, Paul E. Herschel, president of the Herschel Manufacturing Co., told members of the Illinois Implement Dealers' Association at the annual meeting here. Mr. Herschel based his predictions upon the marked advance in ratings given notes and other securities of implement dealers by the banks, increased prices for farm produce, general industrial improvement and the low rate for money.

The automobile, he said, has been a help to the implement man and not a handicap, because its year-round means of locomotion will distribute business over the full period and not make it necessary for the dealer to buy far in advance. Mail order houses are feeling the effect of the automobile already, he said, because they cannot give the service the local dealer does.

Frank P. Hanson, extension specialist of the University of Illinois, claimed that 6000 farm tractors were idle this year because they were worn out or needed repairs the farmer could not or would not afford.

G. M. Exports 47,668 Units in 9 Months

Value Was $26,107,728 or 26.8 Per Cent of Manufactured Articles Sent from U. S.

LANSING, MICH., Dec. 17—In a statement issued by the sales department of the Olds Motor Works, General Motors exports for the first nine months of this year are placed at 47,668 units of a value of $26,107,728.

"Manufactured articles exported from the United States for the first nine months of 1924," the statement says, "represented a total of $2,064,211,775. Of this amount motor cars and trucks were $97,585,544, of which $26,107,728, or 26.8 per cent, represents the volume of General Motors exports.

"When Canadian exports are added, we find a total shipment of cars and trucks (excluding Ford assembly parts) amounting to $117,084,042, of which $37,357,445, or 31.6 per cent, is General Motors' share. For the same period all British automotive exports amounted to $8,647,020. In other words, General Motors alone exported more than four times the total of all the foreign sales of British manufacturers."

Growth in Exports

The growth in exports from ten years ago is shown in the following table:

	General Motors Production in Units	General Motors Exports in Units	Percentage of Increase
Fiscal Year 1914	63,000	2,505	3.9
Fiscal Year 1919	391,000	8,594	2.1
First 9 Mos. 1924	543,304	47,668	8.7

It is also shown in the statement that of the total cars now running in the principal countries of Europe the most recent figures indicate that the following percentages are American cars:

France	5.6%	Poland	68.4%
England	34.5%	Portugal	66.0%
Italy	17.4%	Spain	71.2%
Germany	6.3%	Sweden	95.7%
Belgium	51.3%	Switzerland	19.1%
Austria	12.8%	Holland	82.2%
Denmark	92.5%	Czecho-Slovakia	9.0%
Norway	97.2%		

It is predicted that the percentage of Germany and Czecho-Slovakia will increase heavily in the next two years.

BUDD TO HOLD CONVENTION

PHILADELPHIA, Dec. 16—Budd Wheel Co. will hold a convention of forty or fifty of its leading distributors from all parts of the country at its plant here just preceding the New York show. The tentative program includes meetings here on Dec. 30 and 31, with the entire party going to Atlantic City for New Year's Eve. From that city the company will take the party to New York for the opening day of the show on Jan. 2.

Want More Taxes Paid by Automobile Users

National Grange Report Says They Should Shoulder More of Highway Costs

WASHINGTON, Dec. 17—A recommendation that passenger car owners and truck users should pay a much larger share of the taxes expended in highway construction, and that they should bear all the expenses of upkeep, is contained in the annual report of the National Grange, with headquarters here, representing 2915 granges throughout the country, having approximately 2,600,000 members.

The report points out that out of a total annual expenditure of approximately $1,000,000,000 for road construction the automobile users are paying only $300,000,000 annually in registration fees, drivers' license, gasoline tax and personal property tax, plus about $157,700,000 in excise taxes.

"The public pays the balance," the report declares, "and with the increase in size and carrying capacity of our trucks and automobiles, the use of our roads for commercial purposes becomes a matter of serious concern.

"It is unjust and intolerable to continue to compel the general taxpayer to maintain highways that are being worn out and destroyed by automobiles and trucks carrying freight and passengers on a commercial basis. Special taxes should be levied and special assessments imposed upon all commercial users of our highways."

The report further declares that "too much thought and money is spent on scenic highways and boulevards for pleasure purposes, and not enough to our secondary road system, or the farm-to-market roads."

Ten Conclusions Reached

Ten conclusions are set forth summarizing the national body's demands that the motorist and the truck owner, who use the road, should shoulder a larger measure of the highway taxation burden. These are:

(1) That all automobile and truck taxes collected by the Federal Government should be used exclusively for highway purposes.

(2) If the Federal aid policy is continued, Federal funds should be matched largely by State appropriations, and not by local bond issues.

(3) In sections where highways are purely of a national character and serve largely inter-State needs, they should be constructed wholly with Federal Funds.

(4) Farm-to-market roads should be given proper consideration in the development of a national highway program. Our earth roads should not be neglected.

(5) Politics and road material interests should not be permitted to interfere with the efficiency of our highway program.

(6) Commercial users of our highways should pay increased wages or assessments.

(7) The State should impose a gasoline or other excise tax, or some form of graduated license tax, or both, to a point where sufficient revenue can be secured to extend, reconstruct and maintain the efficiency of our highway system.

(8) The pay-as-you-go policy should be advocated wherever possible. Assessments on abutting property should be largely or wholly abolished.

(9) Greater improved highway mileage should not be constructed than can be properly maintained with funds obtained from motor vehicles.

(10) All bonds issued for highway construction should be serial in form and should never run longer than the estimated life of the highway.

N. A. D. A. Announces Convention Program

NEW YORK, Dec. 16—The second annual show convention of the National Automobile Dealers' Association will be held at the Hotel Commodore on Jan. 5, starting at 10 a. m. About 1000 dealers from the Eastern States, Florida and the Pacific Coast are expected, according to C. A. Vane, general manager of the association. The sessions will be presided over by C. B. Warren, president of the Warren-Nash Co. of New York and vice-president of the N.A.D.A.

Production figures as forecast for 1925 and the problems that will confront the industry in marketing that production will be presented by James H. Collins, research manager of the Chilton Co.

Other speakers and subjects follow:

"Budget and Chart Control," Harry M. Fancher, treasurer of Tom Botterill, Inc., Denver.

"Stabilizing the Industry," C. A. Vane.

"The Gold Mine in the Grease," Lynn M. Shaw, assistant general manager of the N.A.D.A.

"The Retail Sales Manager's Job," Edward Payton, Cleveland.

"Doubling the Salesman's Income," W. B. Burruss, sales consultant of the N.A.D.A.

Canadians Want Duty on Automobiles Reduced

OTTAWA, ONT., Dec. 17—Representations are being made to the government from various sources and deputations asking a reduction in the duty on motor vehicles, or at least the elimination of the sales tax. The duty on passenger cars and trucks is now 35 per cent, the excise tax being additional. Prices on the same cars manufactured in the United States and Canada are alleged to show a marked disparity in favor of the former, and it is desired to have this difference modified.

TOOL MAKERS OPTIMISTIC

ROCKFORD, ILL., Dec. 17—E. Du Bruil, manager of the National Machine Tool Builders' Association, was the principal speaker at a gathering here of 50 representatives of some of the largest tool manufacturing plants in the country. Sessions were held in the Nelson Hotel, and although there was no formal program, round-table discussions revealed that the trade is optimistic.

Firestone Reports Net of $8,116,689

Company Increases Common Dividend to $1.50 After Earnings Are Made Public

AKRON, Dec. 17—After making public its report for the year ended Oct. 31, 1924, showing a net profit equal to $17 a share on the common stock, Firestone Tire & Rubber Co. announced an increase in the quarterly dividend on that issue to $1.50, payable Jan. 20 to holders of record Jan. 15. Previously the rate on the common has been $1 quarterly. Directors also declared the regular quarterly dividend of $1.50 on the 6 per cent preferred, payable Jan. 15 to stock of record Jan. 1, and $1.75 on the 7 per cent preferred, payable Feb. 15 to stock of record Feb. 1.

After providing for depreciation, interest and other charges, but before Federal taxes, the company's pamphlet report for the year ended Oct. 31 showed net profits of $8,116,689. This sum, equal to $17 a share on the common, compares with a net profit of $6,104,992, or over $13 a share on the common in the previous year, after allowing for Federal taxes and preferred dividends. The figures include returns from subsidiary companies.

Sales of the parent company and subsidiaries in the United States totaled $85,610,004, against $77,583,149 in the previous year.

Consolidated balance sheet of the company and United States subsidiaries as of Oct. 31, 1924, shows cash holdings of $4,445,367, against $4,242,359 the previous year; bills receivable of $9,483,161, against $8,153,647, and inventory valued at $13,831,493, against $12,569,066. Accounts payable aggregated $3,636,840, against $2,191,521.

(*Continued on page* 1068)

Charges Fisk Violated U. S. Anti-Trust Law

WASHINGTON, Dec. 17—The Fisk Rubber Co. of Chicopee Falls, Mass., has been charged with violation of the Clayton anti-trust law in a complaint issued by the Federal Trade Commission, Commissioner Van Fleet dissenting.

The company was charged with substantially lessening competition by acquiring approximately 51 per cent of the stock or share capital of the Federal Rubber Co. of Cudahy, Wis. The latter concern, it was alleged, previously had taken over the physical assets of the Federal Rubber Manufacturing Co. of Cudahy.

Incidentally the complaint of the commission declares that there are 528 establishments in the United States engaged primarily in the manufacture of rubber products and 160 such concerns manufacture rubber tires.

Tariff Retaliation Urged by N.A.C.C.

Delegation Visits Washington to Seek Enforcement of Provisions in the Law

WASHINGTON, Dec. 17—Enforcement of the retaliatory provisions of the tariff act as a means of preventing discrimination by foreign countries against imports of American automobiles was sought by a delegation of 15 members of the National Automobile Chamber of Commerce who waited on government officials here today. The delegation, headed by John N. Willys, president of the Willys-Overland Co. and Pyke Johnson, Washington representative of the N. A. C. C., called at the State Department, the Department of Commerce and the Tariff Commission headquarters.

It was declared by spokesmen for the delegation that not only have some countries in Europe discriminated against American automobiles, but in the administration of their tariff laws they have made it difficult for shipments from this country to compete in their markets.

Germany Restricts Importations

Germany, it was shown, has an embargo on the importation of automobiles, shipments entering only under permit. It was asserted that it is twice as hard for an American automobile producer to get a permit as it is for a French producer. It was also contended that Germany is contemplating the establishment of a new and almost prohibitive duty on automobiles.

The delegation stated, as actual instances of discrimination, that Finland has a general duty on imported automobiles of 8¾ per cent, but that the rate on American automobiles is 22 per cent. Poland, it was said, assesses duty on American automobiles at the rate of 100 per cent, but on French automobiles only at the rate of 60 per cent. In other countries, it was declared, the entry of American automobiles is made difficult by the administration of the tariff laws even where there is no discrimination in rates.

Early Action Not Likely

An informal hearing was granted the delegation by the Tariff Commission and consideration of the complaint was promised. The commission requested the filing of tables of exports of American automobiles to various European countries with specific instances of discrimination given.

There appears to be little likelihood of action by the administration at an early date. For more than a year several reports on alleged tariff discrimination, including automobiles, which were made by the Tariff Commission to the late President Harding, have been on file at the State Department, where they were sent by the White House.

AUTOMOTIVE INDUSTRY SEEKS FOREIGN TRADE

WASHINGTON, Dec. 17—If inquiries received from American manufacturers by the U. S. bureau of foreign and domestic commerce can be accepted as indicative of their quest of foreign business, then the automobile industry ranks second to all other industries in its quest of foreign trade.

This is shown in the bureau's annual report, stating that during the last fiscal year a total of 1,250,000 queries were received.

Exporters of farm products were the most industrious in their search for information leading to foreign business, through the offices of the foodstuffs division of the bureau, which handled 143,000 inquiries during the year.

Then came the automobile industry, which sought data in 106,000 cases.

In view of the efforts of the administration to negotiate a series of new commercial treaties, it is not believed that the retaliatory provisions of the tariff act will be resorted to in the near future.

M. A. M. A. Gives Luncheon in Opening Credit Branch

DETROIT, Dec. 15—Members of the Motor and Accessory Manufacturers Association in this territory attended a luncheon given at the Hotel Statler to meet H. J. Quirk, head of the newly established branch office of the credit department of the M. A. M. A. Mr. Quirk was introduced to the members by M. L. Heminway, general manager of the association.

The establishment of the branch is one step in the expansion of the credit service of the organization. It is located at 2125 First National Bank Building, and will be in operation Jan. 1. It will serve as the center of the field research and investigation activities and will carry full credit information for the benefit of members. Headquarters of the department will continue to be maintained in New York.

NORRIS HEADS COMPANY

INDIANAPOLIS, Dec. 16—The Indianapolis Manufacturing Co., which makes wood separators for storage batteries, has been reorganized and J. E. Norris has been elected president.

HOUSE PASSES ROAD BILL

WASHINGTON, Dec. 15—Carrying appropriations of $80,000,000 for road construction in cooperation with the federal-aid highway construction program, the Agricultural bill, providing a total of $124,000,000, was passed by the House this week and sent to the Senate.

N.A.C.C. Traffic Men Talk Rate Revision

Railroad Tariffs in Eastern Districts Discussed at Monthly Meeting

DETROIT, Dec. 16—The revision of railroad freight rates affecting shipments east of Buffalo and as far west as Detroit, Chicago and the Mississippi River occupied the attention of traffic men, members of the National Automobile Chamber of Commerce, at their monthly meeting here. In approving the report of the special committee which has been studying this question, it is planned to have the industry represented at the hearings beginning in Washington before the Interstate Commerce Commission on Feb. 4, when the railroads will present testimony in support of the advanced schedules they have proposed to the commission. It developed at the meeting here that automobile traffic men are active also in local organizations which are planning to appear at the hearings.

Commissioner Eastman, who is in direct charge of these particular hearings, has announced that after hearing the railroads adjournment will be taken for a brief period in order to give shipping interests an opportunity to study the carriers' testimony. His statement indicates that the commission will seek information as to the extent it should be influenced by the effect on business conditions in changing rate adjustments of long standing.

Represented at the meeting were:

American La France, Autocar, Cadillac, Chevrolet, Dodge Brothers, Durant, Flint, Garford, General Motors Corp., General Motors Traffic Association, Hudson, Hupp, International (Mack), Lincoln, Motor and Accessory Manufacturers' Association, Gray, Mason, Maxwell, Nordyke & Marmon, Olds, Packard, Paige-Detroit, Pierce-Arrow, Reo, Studebaker, White, Yellow Cab, K. A. Moore of the N.A.C.C. and James S. Marvin, chairman of the conference.

Reorganization Plan Adopted for Lexington

INDIANAPOLIS, Dec. 13 — Definite plans for the reorganization of the Lexington Motor Co. of Connersville were decided upon at a meeting of Lexington interests. Continuation of the manufacturing of the Minute Man and the Concord Lexington lines is to proceed, it is understood.

Reports from Connersville state that under the management of William P. Herod, receiver, sales for 1924 have exceeded the 1923 record by 30 per cent. The receiver looks forward to doubling output for 1925.

Although the policy of making no yearly models is to be followed, at the New York Show it is said a new Lexington De Luxe Sedan will be exhibited.

Briggs to Offer Stock to Public

Body Company to Increase Amount from 683,000 to 2,025,000 Shares

DETROIT, Dec. 18—With the assent of stockholders, Briggs Manufacturing Co., one of the large body companies of the industry, will change the basis of its stock and for the first time offer part for general sale. Stockholders of the company are to meet Dec. 22, but as the large holders have already signified acquiescence in the plan, its adoption is practically certain.

Present stock of the company will be increased from 683,000 shares no par to 2,025,000, of which 2,000,000 will be outstanding. Under the plan, 400,000 shares of the new stock will be offered to the public, the balance remaining in the hands of the present controlling interests. The new stock, it is understood, will be offered at $39 a share.

The Briggs company, fourth largest employer of labor in the city and one of the most important body companies in the industry, is one of the last of the big automotive companies to offer its stock for general sale. The company starting as a body trim and paint plant by W. O. Briggs and a small group of associates, has developed over a period of 20 years into one of the big manufacturing companies of the country. Stock at all times has been closely held. Only recently the company contested the right of a brokerage company to list it on the general market.

The Briggs company manufactures all coupe bodies for Ford Motor Co., building these sectionally for assembly at the Ford assembly plants. It also builds all Hudson-Essex coach bodies. It has for a number of years confined its operations to these two companies, but is now understood to be planning to add new accounts.

The company through the purchase of the Michigan Stamping Co. about a year ago perfected an organization which starts its product from the raw material stage and does all the manufacturing operations itself.

Stock Dividend Reported as General Tire Plan

AKRON, Dec. 15—Record earnings are expected to be shown in the annual report of the General Tire & Rubber Co., to be made public at the stockholders' meeting Dec. 27. This company has paid dividends on common and preferred stock since its inception, and always has adopted a liberal policy toward stockholders. An extra disbursement to common stockholders in the form of a large stock dividend is anticipated this year.

Annual meetings of the majority of other local rubber companies will be held in January and early February. With few exceptions, officials report that earnings will be greater this year than in the preceding year.

The B. F. Goodrich Co. is reported to be earning about $9 a share on the common stock.

RUBBER MEN URGE TIRE PRICE RAISE

AKRON, OHIO, Dec. 15 — The majority of rubber executives here are of the opinion that the price of tires should be advanced to conform to the tremendous increase in the cost of crude rubber and other raw materials, but it is not generally believed there will be any change in present tire prices in the near future.

"As long as one big tire producer persists in a policy of keeping tire prices at rock bottom levels," one executive said, "it is useless to talk of higher prices.

"One thing is regarded as almost certain, however, and that is that there will be no cuts in tire prices, such as nearly disrupted the industry in recent years."

N. A. C. C. to Hear Famous Financier at Banquet

NEW YORK, Dec. 15—Dwight W. Morrow, of the firm of J. P. Morgan & Co., will be the principal speaker at the banquet of the National Automobile Chamber of Commerce at the Hotel Commodore, on Jan. 6. Mr. Morrow is an authority on financial questions.

Neal O'Hara, columnist of the New York *Evening World*, and well known as a humorist, will also occupy a prominent place on the program for that evening.

Not the least important of the features is the annual presentation of medals to leaders of the industry for specific achievements during the year.

Arrangements are rapidly being concluded for the banquet, which is expected to have an attendance of 800 persons identified with the industry. Walter P. Chrysler is chairman of the committee and associated with him are Harry H. Bassett, F. C. Chandler, Roy D. Chapin, A. R. Erskine, Myron E. Forbes and Harry M. Jewett.

222,127 Cars and Trucks Produced in November

WASHINGTON, Dec. 17—Production of passenger cars and motor trucks in November totaled 222,127, according to figures compiled by the Department of Commerce. This compares with 313,024 units in November of 1923 and 289,370 in October of this year.

Passenger car production amounted to 195,279, compared with 257,915 in October, a loss of 62,636.

Truck output totaled 26,848 compared with 31,455 in October.

Lehigh Saves $3,900 with Motor Truck

Expenses Reduced That Much a Month by Using It on a Local Freight Train

NEW YORK, Dec. 16—The Lehigh Valley Railroad has effected a saving of $3,900 a month or 80 per cent of the former cost of the service through using a motor truck and trailer to replace a local freight train hauling less-than-carload freight between Ithaca and Geneva, N. Y. This has been accomplished as follows:

	Train Cost a Month	Truck and Trailer Cost
Engine Crew	$ 466	....
Train Crew	1,054	....
Locomotive Repairs	1,652	....
Fuel, Water, Oils	1,552	....
Freight Car Supplies	42	....
Freight Car Repairs	49	....
Contract Per Month	....	$900
Total Cost	$4,816	$900
Per Day Cost	$193	$36

The truck is operated on a schedule, movements being subject to the orders of a train dispatcher. The contract price of $36 a day for the motor truck includes insurance against loss and damage. Since the service was begun in October there has been much less damage to shipments than formerly, when small consignments were knocked about by the frequent stopping of the freight cars.

Another experiment that the Lehigh has been making is the substitution of a 40-passenger rail motor coach for a train on the run between Plainfield and Perth Amboy, N. J. A crew of two men have supplanted the five who manned the train. This experiment has paid for itself during the first year of operation and, with the successful use of the motor truck has led to further study of the possibilities of extending the use of these types of equipment.

Goodrich Announces Big Group Insurance Plan

AKRON, Dec. 15—Announcement of the inauguration of a group life insurance plan, covering 15,000 employees and costing $25,000,000 was made here by officials of the B. F. Goodrich Co. It is one of the largest welfare projects undertaken by an industrial corporation for the benefit of its employees.

More liberal benefits and larger individual policies for workers are provided than in the old form of insurance carried by the company.

The plan is operated on a contributory basis, whereby all men in the employ of the company for a period of three months or more may obtain a $2,000 policy at a cost of $1 a month, and women a $1,000 policy at a cost of 50 cents a month.

Goodrich took out group insurance for its employees nine years ago, with individual amounts varying from $500 to $1,000 a year.

Indianapolis Shows Increased Schedules

December and Winter Production Plans Better This Season Than Usual

INDIANAPOLIS, Dec. 16—December and winter production plans and schedules of several Indianapolis motor car and accessory plants are better this year than usual. Nordyke & Marmon, with its new line of cars and with the special moderate priced sedan, is showing up well with a production that will average from 500 to 600 per month, with December running a little better.

Premier, with its taxicab, has been busy all season. Not long ago it increased its schedules. Its new model likely will increase the production schedule further.

H. C. S. Cab Manufacturing Co. got into production last month and December will see the factory in almost full operation. This company announced its new line late in the summer and about two months ago formed a new company with reorganization of the capital and larger plans that it had when it was confined to passenger motor car production as the H. C. S. Motor Car Co.

The H. C. S. Taxicab selling at $1,880 is the lowest priced vehicle made here. It promises to be a very prominent factor in local automotive production.

Ahead of 1923 Record

Both Prestolite and Wheeler-Schebler are doing well. Prestolite is ahead of last year records, especially for winter schedules. New factory equipment contracts for starting and lighting units, also the radio batteries, are more than balancing lower production plans of some factory customers.

The Wheeler-Schebler Carburetor Co. has a similar production record. During the year and especially the latter part it has made strides in new factory equipment contracts. Winter production schedules are ahead of those of last year.

The Indianapolis plant of the Martin-Parry Corp. and the Oakes Co., its local subsidiary, have full schedules, with the Oakes company also employing a night shift. Several other parts makers are also busier than usual at this time of the year.

Predicts Wider Use of Alcohol as Fuel

NEW YORK, Dec. 17—Wide use of industrial alcohol as liquid fuel, called less risky than gasoline, was predicted in an address before the Cornell Club of New York by Dr. Leo Hendrik Baekeland, president of the American Chemical Society. Safety and cleanliness, he said, will bring about extended employment of alcohol in households, automobiles, and in other ways.

Dr. Baekeland attacked the Cramton bill, which, he charged, would confer despotic power upon the prohibition unit, and asserted that the nation in peace and war was largely dependent upon the chemical industries. Agriculture, he declared, would provide alcohol for the nation long after the sources of gasoline and petroleum have been exhausted.

In speaking of the bill, Dr. Baekeland said:

> The Cramton Bill, which has already passed the House of Representatives and next goes to the Senate, wants to shift the administration of industrial alcohol from the internal revenue bureau, where it belongs, to the notoriously inefficient prohibition bureau.
>
> The general public does not class the manufacture of alcohol as a chemical industry. Most people cannot see in alcohol anything but its use or abuse as a beverage. And yet, outside of such uses, there is hardly a chemical susceptible of wider and more beneficial application in the arts, the industries and the household economics. Its value as a solvent, its use in varnishes, artificial leather, smokeless powder, is well known among chemists.

U. S. Attention Called to Swedish Road Law

WASHINGTON, Dec. 15—To meet the requirements of the Swedish road law, which limits the total load on each wheel to 2000 kg. (4400 lb.), a firm in Malmo, the Auto-truck Co., has brought out a six-wheeled truck.

In sending this item to the Automotive Division of the Department of Commerce, the American consul at Stockholm suggests that American truck manufacturers seeking business in Sweden keep this provision of the Swedish road law in mind.

Wood Says More Buses Would Relieve Congestion

NEW YORK, Dec. 17—In a speech at the University Forum of America on "How the Motor Bus Can Help Relieve Street Congestion," Frederick T. Wood, president and general manager of the Fifth Avenue Coach Co., made a plea for a greater use of buses as at least a partial solution of the transit problem.

Mr. Wood gave the results of several surveys which, he said, showed that there would be a great increase in the passenger-carrying capacity of streets by the use of more buses. He stated that with practically the same number of vehicles passing in one direction on three streets, Fifth Avenue, with 66 coaches, or 12.2 per cent of all the vehicles, has a passenger-carrying capacity nearly four and one-half times as great as Seventh or Park avenues, on which there is no motor bus service.

A survey in Chicago, Mr. Wood added, showed that on the average automobiles required about 54 sq. ft. of street space per seated passenger, and that only 3 sq. ft. per passenger was the space required by the motor bus.

REPORTS ON MUSCLE SHOALS

WASHINGTON, Dec. 13—In his annual report Major General Taylor, chief of engineers of the army, said the Muscle Shoals electrical power and nitrate plants would be ready by July 15, 1925.

Col. Ayres to Address S.A.E. on 1925 Outlook

Dr. A. E. Morgan Will Be Another Speaker at the Annual Dinner, Jan. 8

NEW YORK CITY, Dec. 17—Col. Leonard P. Ayres, economist and financial statistician, will address the annual dinner of the Society of Automotive Engineers at the Hotel Astor on the evening of Jan. 8. Colonel Ayres will analyze present economic and business conditions in the United States and will indicate what effect these may have on the production and sale of automobiles and automotive equipment during the year 1925. He will pay particular attention to the status of the farmer.

Dr. A. E. Morgan, president of Antioch College, will give the other formal address on the S. A. E. dinner program. Dr. Morgan will present some intensely practical educational theories which are being tried at Antioch. He puts both teacher and student to work in industry at periodic intervals.

C. F. Kettering, toastmaster of past S. A. E. dinners, will be master of ceremonies again this year. Brief addresses will be made by Henry M. Crane, president of the S. A. E., and H. L. Horning, 1925 presidential nominee.

Strickland Gillilan, prominent humorist, will close the program with a bit of nonsense. The musical entertainment will be most comprehensive, including an organ recital, male quartette, soloists and large orchestra.

Illinois Implement Plants Show Employment Gain

CHICAGO, Dec. 17—The gain in employment at automotive plants in Illinois, noted in August and September, did not continue into October, according to the survey for that month by the Illinois Department of Labor. The tabulation shows that the automotive payroll at the end of October was 0.6 per cent below the level at the last of the preceding month. There was a gain in September of 10.8 per cent.

The number of automotive employees at the end of last October was 19 per cent under the number noted at the same time last year.

October brought a pick-up in employment at agricultural implement plants of 5.5 per cent, while there was a gain here of 3 per cent in September.

SEEK WINNEBAGO RECEIVER

FREEPORT, ILL., Dec. 17—The Clipper Lawn Mower Co. of Dixon and the Nugent Steel Co. of Chicago, with claims aggregating $5,500, are petitioning creditors against the Winnebago Tractor Co. of Dixon to have the firm declared bankrupt. They have asked the court to name a receiver.

Production Started on New Case Line

Chassis of "Ten-Year Car" Is Practically the Same as That of the Model "Y"

RACINE, WIS., Dec. 17—Production is now under way on the new Jay-Eye-See line of automobiles by the Case Motor Car division of the J. I. Case T. M. Co. This line was recently announced as the "Ten-Year Car." The chassis is practically identical with that of the Case Model Y line, production of which is being continued, except that it is somewhat smaller to accommodate 5-passenger bodies, instead of the 7-passenger bodies of the Model Y.

Both models have a Continental six cylinder engine, but the Jay-Eye-See engine is 3⅜ x 4½, as compared with 3¾ x 5 in the Model Y. The newer model uses a 1¼ in. Schebler carbureter, as compared with 1½ in. used on the larger model.

Other comparisons of the Jay-Eye-See model with the older model, wherein there are differences, follow:

	J.I.C.	Model Y
Rear axle shafts —diameter	1⅜ in.	1⅞ in.
Frame	6 1/16 x 2½ x 3/16 in.	6⅛ x 2½ x 7/16 in.
Brake drums	14 x 2 in.	16 x 2½ in.
Front springs	2 x 39 in.	2 x 39½ in.
Rear springs	2¼ x 55 in.	2½ x 57 in.
Wheel base	122 in.	132 in.
Tires (cord)	32 x 4½ in.	33 x 5 in.

Lockheed hydraulic four-wheel brakes are now standard equipment on both models. Balloon tires are furnished at extra cost. Both models are equipped with Saal high pressure chassis lubrication.

The Jay-Eye-See line is furnished in the following body styles and prices:

Roadster	$1,840	
Touring	1,885	
Special touring	2,160	
Brougham	2,690	(2,690)
Sedan	2,590	

Standard equipment on the inclosed models includes windshield wiper, rear view mirror, Motometer, clock and heater. Optional color finishes are Jerry blue, platinum blue and Case gray.

Premier Produces Taxicab with Four Wheel Brakes

INDIANAPOLIS, Dec. 17—Premier is in production on a new model taxicab with four-wheel brakes, Columbia front and rear axles, shorter wheel base, 112 in., and a new body and frame, but with the same motor as used heretofore.

Bellflex fabric shackles are used on front and rear springs, which are flatter and protected by boots. Carl Pick rubber and fabric universals are used, together with a new design of motor support by Premier's chief engineer, R. Kuenzel. At the front the engine is carried in a sleeve or collar, around which is a rubber and fabric disc, which in turn is carried in a casting seamed to the frame.

The body now has sweeping lines. The seating capacity remains the same, despite the shortening of the wheel base. Bumpers are provided at both the front and rear, and the dash type driving lights have been adopted, replacing the conventional headlights. The starter operates from the dash.

The size is 35 by 5 inches. No change has been made in the price, $2,400 f.o.b. factory.

Gardner Produces New Eight-in-Line Series

ST. LOUIS, Dec. 17—Gardner is bringing out a new eight-in-line series in which the closed and open models are the same price. The new models will be shown for the first time at the New York automobile show.

There are only two body models at present, the phaeton and brougham, both listing at $1,995. Both have low hung bodies, balloon tires, four-wheel brakes, Disteel wheels and special balloon type snubbers. Duco finish is used in two tone combinations.

The engine is of the L-head type, 3⅛ x 4½ in., giving a piston displacement of 276 cu. in. The brake horsepower is around 75.

Kissel Bringing Out New Straight Eight

HARTFORD, WIS., Dec. 17—The Kissel Motor Car Co. is bringing out a straight eight to be a part of the 1925 line. This chassis will be provided with all the body styles that are used on the present models.

Two new body designs will also be brought out, a four-door De Luxe brougham sedan to be fitted to both the six and the eight, and a new low priced 5-passenger brougham on the six only.

Lincoln Starts Clutch Plate Exchange Service

DETROIT, Dec. 17—In order to relieve its dealer service stations of the work of relining clutch plates, the Lincoln Motor Co. has put into effect a plan whereby dealers may exchange a set of clutch plates in need of relining for a set relined at the factory at a cost to the car owner of $6.50.

After riveting new lining to the plates it is necessary to compress them to make sure that the assembly will be the correct thickness. Through lack of proper equipment dealers have been experiencing trouble in doing this work properly.

To avoid such difficulties, the factory is now offering to do this work on an exchange basis, as it has all the necessary tools for straightening, riveting and compressing the clutch plates.

DENBY RAISES TRUCK PRICE

DETROIT, Dec. 17—Effective Jan. 1, 1925, the Denby Motor Truck Corp. will advance the price of its model 41, 1-ton truck, from $1,395 to $1,485, an increase of $90, according to an announcement made here.

Volume Producers Lead in Wisconsin

December Maintains November Record—Competition Keen in Medium Priced Field

MILWAUKEE, Dec. 17—With a gratifying demand for passenger cars shown in the first half of December, the November record of sales is being well maintained by a number of the leading makes. There is a fair demand for the average run of makes, but the situation has come to be such that the bulk of the business is being done by the volume producers.

Competition in the medium priced field is keen. Several leading distributors are injecting into their advertising the various claims to leadership in this field, which obscures, superficially at least, the activities of lesser lights.

In Milwaukee and Milwaukee county, during November, registrations of new cars gave Nash the lead, with Ford first. Hudson ranked third, Buick fourth, Essex fifth, Chevrolet sixth and Overland seventh, with Maxwell, Hupmobile, Dodge Brothers, Studebaker, Oakland and Oldsmobile in the order named. In the entire State of Wisconsin Nash held fourth position, led only by two of the lowest priced fours and the third highest leading by a margin of five cars.

The Hudson-Essex distributor, on the other hand, advertises that in November Hudson-Essex sales for Milwaukee city and county outnumbered all other makes except Ford, and in the State all but the two lowest-priced fours. This leadership obviously is gained by combining the sales of Hudson and Essex. Claim is also made and substantiated that, exclusive of Ford, Hudson and Essex sales represented 19 per cent of all November sales in Milwaukee County and 14 per cent in the entire State.

Buick business is reported well above last year in Milwaukee and elsewhere in the State. The Studebaker line appears to have made a good impression, judging by the marked upturn in the sales curve since the middle of September.

New Stanley Steam Car Produced for Shows

NEWTON, MASS., Dec. 16—The Stanley division of the Steam Vehicle Corp. of America will announce a new steam passenger car at the New York and Chicago automobile shows. It will be somewhat smaller and lower priced than the existing Stanley models. It will have 122 in. wheel base, as compared with 150 in. It will be more compact and 4 in. nearer the ground.

There will be two body styles, a five-passenger phaeton at $2,500 and a five-passenger sedan at $3,300, both lower in price than the present models.

Balloon tires, 31 x 4.5 in., and hydraulic four-wheel brakes are fitted as standard equipment.

Firestone Reports Net of $8,116,689

Company Increases Common Dividend to $1.50 After Earnings Are Made Public

(*Continued from page* 1063)

The company reported no notes payable as of Oct. 31, as compared with a total of $5,770,000 notes payable on the same date last year. Profit and loss surplus was $31,715,320, against $24,741,294 as of Oct. 31, 1923.

Official announcement of plans for increasing production of automobile tires on a large scale at the Firestone company's Akron plant was made by President Harvey S. Firestone at the annual stockholders' meeting.

New equipment and modern machinery, to be purchased immediately by the company at a cost of several millions of dollars, will increase the capacity of the Firestone factory from 32,000 to 42,000 tires a day, Mr. Firestone said.

By adding 10,000 tires a day to its output, Firestone will become the largest single tire producer in the world. It is understood that contracts made with Henry Ford for next year call for a substantial increase over last year's schedule. Firestone's Plant 2, which was built several years ago, is devoted almost entirely to the manufacture of Ford size tires. An endless chain method of manufacture in this factory enables the production of these small sizes at a lower cost than most companies.

Turn for Better Revealed

The turn for the better that has developed in the last few months is clearly revealed in the Firestone announcement of expansion. It will be recalled that early last fall Mr. Firestone became alarmed at what he termed an overproduction of motor vehicles and tires and in a statement to dealers he warned them of the danger of becoming tied up with a large inventory.

Another interesting development at the Firestone meeting was the president's announcement that the company is developing an organization for the importation of crude rubber from Liberia, on the west coast of Africa. This is another move, Mr. Firestone said, in his fight against the British rubber restriction act, which he blames for forcing the price of crude rubber to present high levels. The company's crude rubber refining plant at Singapore has been furnishing the major portion of the raw material for tire and footwear factories.

Discussing the pioneering and developing of balloon tires, Mr. Firestone said:

> The balloon tire has revolutionized tire construction, and has been adopted by practically all automobile manufacturers as standard equipment for 1925.
>
> The increasing popularity of the balloon tire, the increasing use of pneumatic bus and truck tires, and unusually low prices, giving the greatest values we have ever offered, have created an increasing demand from both dealer and consumer, and give us every reason to look forward to a prosperous year.

TRADE DAY TICKETS ARE NOT ESSENTIAL

NEW YORK, Dec. 17—In sending out credentials for the trade days at the New York and Chicago national automobile shows the show management feels that naturally many persons eligible to attend on these days will be overlooked.

The management therefore announces that whether or not they receive credentials all responsible persons in the trade may attend and should attend.

All they have to do is to identify themselves at the Bronx Armory in New York or the Coliseum in Chicago.

Mailing of credentials has been started.

Wide interest is being shown in the trade days among all branches of the industry.

Detroit Steel Works Out New Bus Spring Device

DETROIT, Dec. 16—A new application for progressive-type rear springs on double-deck and other heavy-duty buses has been worked out by the Detroit Steel Products Co. Factory tests are completed and road tests are now being conducted with a number of bus manufacturers, with a view toward adapting the spring to the individual requirements of each particular unit.

The principal feature of this new "hook-up," on which patent claims have been filed, is the employment of an auxiliary spring, mounted either above or below the main spring and so designed that one end gages before the other.

Ford Ship Completes First Southern Voyage

NEW ORLEANS, Dec. 17—The Oneida, the first ship of the Ford Motor Co. to make southern ports, put in at the assembling plant of the Ford company at Chalmette, just south of New Orleans, last week and discharged parts for over 1500 Ford cars.

The ship made the voyage from Detroit via Montreal to Jacksonville, Fla., where a portion of its cargo was unloaded at the Ford plant.

From New Orleans the boat was scheduled to carry the remainder of her cargo to the Ford assembling plants at Houston.

Touring Grand Prix Race Set for July 19

Fully Equipped Passenger Cars Required in Contest on Montlhery Track

PARIS, Dec. 10 (*by mail*)—Fully equipped passenger cars are called for in the Touring Grand Prix, which will constitute the most important race of its type to be held in France next year. The race will be run on Montlhery track and road circuit on July 19. It will be the first of a series, continuing one week, and terminating with the 122-inch Grand Prix.

Provision is made for four classes of cars:

91½ cu. in., 1433 lb. empty, two passengers, 19.59 miles to the American gallon.
91½ to 183 cu. in., 2314 lb. empty, five passengers, 13 miles to the gallon.
183 to 305 cu. in., 3857 lb. empty, seven passengers, 10.7 miles to the gallon.
305 to 488 cu. in., 4850 lb. empty, seven passengers, 9.8 miles to the gallon.

Distance to be covered varies from 590 to 714 miles, according to the size of the car. As the start will be given at midday there will be three to four hours of night driving. Only the driver will be permitted aboard the cars and he will not be allowed any outside assistance. Ballast equivalent to the total number of passengers will have to be carried. Two spare wheels per car will be allowed. The number of spare tubes will not be limited, but they must be carried aboard the car. Spare parts may be carried, providing they do not occupy the space reserved for passengers.

Coast Tire Company Pays All Creditors in Full

OAKLAND, CAL., Dec. 16—Announcement is made by the reorganized Coast Tire & Rubber Co. that it has paid all creditors 100 cents on the dollar and that it has paid all government, State, county and city taxes, delinquent and due.

It is stated that J. C. Hughes, president, and Luis S. Budo, vice-president, have accomplished this result through the financial assistance given by W. H. Weilbye of Oakland to the extent of more than $100,000. In addition to enabling the company to meet its debts, this sum places it in a position to carry out its contemplated expansion program in full.

The Coast Tire factory has been in continuous operation since the organization of the new corporation.

GETS IMPLEMENT TRADE

LANSING, Dec. 15—Melling Forge Co., which operates principally on products for the automotive industry, has taken on considerable business for farm implement manufacturers in recent weeks, indicating, according to J. W. Wilford, president and treasurer, the expectancy of large business.

Men of the Industry and What They Are Doing

Pratt Advances to New Position

Francis C. Pratt, vice-president of the General Electric Co. in charge of engineering, has been appointed vice-president in charge of manufacturing to fill the vacancy caused by the resignation of George E. Emmons. Mr. Pratt will also be chairman of the manufacturing committee with the title of vice-president in charge of manufacturing and engineering. H. F. T. Erban has been appointed assistant vice-president in charge of manufacturing and engineering under Mr. Pratt.

Schmid Promoted by United Alloy

Martin H. Schmid, formerly metallurgical engineer of the United Alloy Steel Corp., has been appointed assistant general manager of sales, Alloy division of the corporation. Mr. Schmid was graduated from Lehigh University in 1907 and for two years was engaged in power plant work. In 1909 he became associated with the United Alloy Steel Corp., then known as the United Steel Co., as mechanical engineer. In 1915 he organized the company's present metallurgical department. He is a member of the American Iron and Steel Institute, British Iron and Steel Institute, American Society of Testing Materials, American Institute of Mining and Metallurgical Engineers, Society of Automotive Engineers and American Society for Steel Treating.

Langemo Made Stoughton Officer

O. S. Langemo has been elected a vice-president and appointed assistant manager of the Stoughton (Wis.) Wagon Co., which now devotes practically all its facilities to the manufacture of motor trucks and truck and motorbus bodies. Mr. Langemo wil be the immediate assistant of F. J. Vea, president and general manager.

Bottume Joins Cowles Staff

M. S. Bottume, identified with the industry for more than 20 years, has rejoined the staff of C. Cowles & Co., New Haven, Conn., in the capacity of sales manager.

Russell Made Branch Manager

Francis C. Russell has been appointed manager of the Rochester, N. Y., branch of North East Service, Inc., succeeding G. A. Johnson. Mr. Johnson has assumed the managership of the New York branch of the company, taking the place of D. P. Cartwright, who is soon to make an extended trip through the Orient in the company's interests.

Mattioli Goes with Welker

F. J. Mattioli, formerly purchasing agent for the Automobile Crankshaft Corp., has joined the E. H. Welker Co., and will have charge of the automobile stampings and gray iron division.

FEDERAL RESERVE APPOINTS BASSETT

DETROIT, Dec. 17—Harry H. Bassett, president and general manager of the Buick Motor Co. and a vice-president of General Motors Corp., has been appointed a director of the Detroit branch, Federal Reserve Bank of Chicago, for a term of three years beginning Jan. 1, 1925. In making the appointment the Federal Reserve Board in Washington declares it a recognition of qualities possessed by Mr. Bassett that are most fitting for the needs of the banking system.

The directorate as at present constituted is composed of three bankers, two business men, and ex-officio, W. R. Cation, manager of the Detroit branch. The bankers are Emory W. Clark, Julius H. Haass and John W. Staley. The business members are Charles H. Hodges, president of the Detroit Lubricator Co., and James Inglis, president American Blower Co.

It is generally conceded that the appointment of Mr. Bassett is to give greater recognition to the importance of the automotive industry and the necessity for its greater representation on the board in this district.

Anderson Heads Commerce Body

Charles Anderson, secretary-treasurer and general manager of the Belle City Malleable Iron Co., Racine, Wis., has been elected president of the Racine Association of Commerce.

A. M. A. Elects Disher at Chicago Meeting

CHICAGO, Dec. 17—The Automotive Manufacturers' Association at its annual meeting and entertainment at the City Club declared the election of the following new officers and directors:

President, G. F. Disher, Gemco Manufacturing Co., Milwaukee.
First vice-president, E. E. Warfield, Gill Manufacturing Co., Chicago.
Second vice-president, C. D. Pettingell, Apco Manufacturing Co., Providence, R. I.
Directors (two years): J. A. Anderson, Stone Manufacturing Co., Chicago.; Smalley Daniels, New Era Spring & Specialty Co., Grand Rapids.; O. Q. Hinds, Grigsby-Grunow-Hinds Co., Chicago; A. C. Johnson, Apex Electric Mfg. Co., Chicago; John F. Shuford, Wedler-Shuford Co., St. Louis; C. W. Stowell, Outlook Co., Cleveland, and (one year) N. A. Petry, N. A. Petry Co., Philadelphia.

W. E. Green, who has been serving as permanent executive secretary, hereafter will also serve as treasurer. Heretofore the treasurer has been elected from the membership.

Export Trade Day Program Announced

Many Prominent Speakers to Address Meeting in Connection with New York Show

NEW YORK, Dec. 17—Announcement has been made of the completed program for the foreign trade meeting to be held at the armory, in connection with the automobile show, on Tuesday, Jan. 6, which has been designated as Export Trade Day. This meeting, under the cooperative direction of the Motor and Accessory Manufacturers' Association, the Overseas Club of the Automotive Boosters' International and *The American Automobile* (*Overseas Edition*) and *El Automovil Americano*, will commence at 2 o'clock. The program follows:

Chairman, H. L. Kraus, President Overseas Club.

"How the Car Exporters Have Paved the Way for Accessory Sales."—James D. Mooney, vice-president General Motors Corp. and president General Motors Export Co. and Overseas Motor Service Corp.

"The Automotive Picture Abroad" (Illustrated)—George E. Quisenberry, editor *The American Automobile* (*Overseas Edition*) and *El Automovil Americano*.

"How to Handle and Finance the Export Orders" (Illustrated)—J. F. Kelly, Jr., export manager Electric Storage Battery Co.

"What Export Sales Have Meant to My Company"—F. B. Caswell, vice-president and sales manager Champion Spark Plug Co.

"The Field in Europe"—Percy Owen, chief, Automotive Division, Bureau of Foreign and Domestic Commerce.

"Here and There Throughout the World"—Short talks by visiting jobbers and distributors from Australia, Mexico and other sections.

Invitations to the meeting have been sent to nearly 1500 executives and sales officials of the various automotive companies and, despite the limited time in which the organizing committee has been at work, many acceptances have been received, evidencing the interest which has been created.

Plans are being made for the entertainment of visitors from abroad during show week. This will be under the direction of F. J. Werner, vice-president of the Overseas Club and president of the Shaler Export Co. of this city. Information concerning the meeting may be obtained either from the organizations cooperating or from The Export Trade Day Committee (Eleventh Floor), 239 West 39th Street, here.

NORMA-HOFFMANN MOVES

STAMFORD, CONN., Dec. 15—The factory and general offices of the Norma-Hoffmann Bearings Corp. have been moved from Long Island City to the company's new plant here.

FINANCIAL NOTES

American Chain Co., Inc., and subsidiaries report net income of $312,406 after depreciation, interest and taxes for the quarter ended Sept. 30, 1924. This is equivalent after Class A dividends to 55 cents a share earned on outstanding 250,000 shares of no par common stock and compares with $1,020,267 before taxes, or $3.38 a share for the common, in the corresponding quarter of 1923. For the nine months ended Sept. 30, 1924, net income was $827,257, or $1.20 a share after preferred dividends, compared with $2,738,669, or $8.90 a share, in the corresponding period of 1923. Profit and loss surplus on Sept. 30, 1924, was $7,884,199, as compared with $8,643,474 a year ago. Balance sheet as of Sept. 30 shows total current assets of $12,752,136, as against current liabilities of $1,700,302, or almost 7½ to 1. Included in the current assets are cash, $1,640,122 and notes and accounts receivable, $5,227,426. Accounts payable amount to $640,375. The company's cash in banks is understood to have increased about $1,000,000. Indicated net earnings for October approximated 60 per cent of the total of the entire third quarter. December is expected to show a larger gross business than in any month since June, 1923, and largely in excess of the gross business transacted in November, 1924.

Briggs Manufacturing Co. has notified stockholders of a special meeting to be held Dec. 22 for the purpose of considering an increase of the authorized common stock to 2,125,000 shares of no par value. It is reported the company plans a stock dividend of about three for one, after which bankers will offer the new stock to the public and apply for listing on the New York Stock Exchange.

Electric Storage Battery Co. has declared an extra dividend of $1 a share on the common, in addition to the usual quarterly payment of $1, both payable Jan. 2 to stock of record Dec. 19. Dividends are also payable on the preferred, of which there is outstanding $32,000, convertible into common par for par.

General Aluminum & Brass Manufacturing Co. has called for redemption, Jan. 1, 1925, at the Detroit Trust Co., Detroit, or the Guardian Savings & Trust Co., Cleveland, at 110 and dividend, all of its preferred stock, except that which holders have elected to exchange for preferred shares of the Bohn Aluminum & Brass Corp.

Bassick Alemite Corp. stock totaling practically all the 200,000 shares has been deposited with the Central Trust Co., Chicago, for exchange for Stewart-Warner Speedometer stock, in accordance with the merger plan, which provided that seven shares of Stewart-Warner be given in exchange for every 10 shares of Bassick Alemite.

Pressed Steel Tank Co., Milwaukee, widely known in the automotive industries, has disposed of an issue of $500,000 first mortgage (closed) serial gold bonds, which are being sold at a premium for early maturities. The issue is dated Oct. 1 and final maturity is in 1939.

American-La France Fire Engine Co. has declared the regular quarterly dividend of 25 cents a share on the common and 1¾ per cent on the preferred. The common is payable Feb. 16 to holders of record Feb. 2 and the preferred Jan. 2 to holders of record Dec. 22.

Maxwell Motor Corp. offering of $3,500,000 first mortgage 5½ per cent golds has been closed, the issue having been oversubscribed. Proceeds are to be used to provide in part for the redemption of $4,750,000 10-year 7 per cent debentures, called for redemption Jan. 26, 1925.

Paige-Detroit Motor Car Co. has declared the regular quarterly dividends of 3 per cent on the common, payable Jan. 2 to stock of record Dec. 20, and of 1¾ per cent on the preferred, payable Jan. 2 to stock of record Dec. 15.

Edmunds & Jones Corp. declared an extra dividend of 50 cents a share on the common, in addition to the regular quarterly dividend of 50 cents; also the regular dividend of 1¾ per cent on the preferred. All are payable Jan. 1 to stock of record Dec. 20.

Murray Manufacturing Co. has declared the regular quarterly dividends of 2 per cent in cash and 2 per cent in stock on the common and of 2 per cent on the preferred, payable Jan. 2 to stock of record Dec. 20.

Bassick Alemite Corp. has declared its regular quarterly dividend of 50 cents a share, payable Jan. 2 to stock of record Dec. 20.

Indian Motorcycle Co. has declared the regular quarterly dividend of 1¾ per cent on the preferred, payable Jan. 2 to stock of record Dec. 20.

Packard Motor Car Co. directors have declared the regular quarterly dividend of 3 per cent on the common, payable Jan. 31, to stockholders of record Jan. 15.

Goodyear Tire & Rubber Co. has declared the regular quarterly dividend of $2 a share on the prior preference stock, payable Jan. 1 to holders of record Dec. 20.

McCord Radiator & Manufacturing Co. has declared its regular quarterly dividend of 75 cents a share on Class A stock, payable Jan. 2 to holders of record Dec. 20.

Chandler Motor Car Co. has declared the regular quarterly dividend of 75 cents, payable Jan. 2 to stock of record Dec. 20.

Fisher Body Plans to Split Stock into Smaller Units

DETROIT, Dec. 17—Fisher Body Corp. capital stock will be split into smaller units, four for one, if stockholders approve the plan as outlined. Directors met here Dec. 15 for the purpose of calling a special meeting of stockholders in New York City Dec. 29.

The plan to be voted upon calls for the authorization of 2,400,000 shares of common stock, par value $25, to take the place of the existing 600,000 shares of no par value authorized and outstanding. Following the approval of the plan, stockholders are to receive four shares of new $25 stock in exchange for each share now held.

The company has just sold $15,000,000 new 5 per cent serial gold notes, the proceeds to be used to retire $17,000,000 outstanding 6 per cent gold notes dated Feb. 1, 1923. These new notes will constitute the only funded debt.

Weston Company Stock Offered to the Public

NEW YORK, Dec. 17—A banking syndicate composed of Hornblower & Weeks and Hambleton & Co. has announced the offering at $25 a share, to yield 8 per cent, of 100,000 shares of the Class A stock of the Weston Electrical Instrument Corp., previously a closed company, which has been incorporated in New Jersey. Each share of Class A stock purchased carries a bonus of one-quarter of a share of the common stock. Application will be made, it is stated, to list the stock on the New York Stock Exchange.

According to the bankers' announcement, the Class A stock is entitled to $2 cumulative dividends from the date of issue, payable quarterly. It is callable at $37.50 a share on 30 days' notice. The Class A stock, in addition, participates equally in all cash dividends after payment of $1 a share in any one year on the common.

CALIFORNIA LENS APPROVALS

SACRAMENTO, CAL., Dec. 15—Bausch & Lomb lens were among the first to be officially approved for use in California. Through an inadvertence they were not included in the list published in the Nov. 27 issue of AUTOMOTIVE INDUSTRIES.

Belgian Show Opens as New Duties Apply

Move Reported Toward Forming Combine to Compete with Foreign Makes

BRUSSELS, Dec. 10 (*By Mail*)—Belgium opened its 17th annual automobile show Dec. 6 in the enlarged Cinquentenaire Palace, having a floor area of 377,000 sq. ft. Coming after Paris and London, the Brussels show does not present any mechanical or structural novelties, but has a very well developed body department and differs from other Continental shows in being really international.

France, America, Italy and Belgium are the countries most prominently represented in the passenger car department. German cars are not admitted, but it is understood that they will be allowed in next year's show.

The opening of this year's exhibition almost coincided with the application of the new and increased import duties, which are 576 francs per 100 kgs., in place of the former 20 per cent ad valorem. These duties affect low priced cars very heavily. The Ford plant at Antwerp has stopped assembling, but whether this is temporary, owing to shortage of stock, or must be looked upon as permanent is not yet known.

American Cars in Lead

Before the new duties went into force Citroen shipped 2000 cars into Belgium and Renault sent 1500. The only other European firm doing a really large business on the Belgian market is Fiat, and it, in common with French and American makers, is affected by the new duties.

There are reports of a combine among Belgian firms to build a low priced car for the home market, the various parts to be built in different factories and assembled in one plant. This is an old plan first brought forward immediately after the war but never put into execution.

Belgian makers always have specialized on high grade costly cars. Minerva, the largest producer, with an output of 2500 cars a year, has four models, all with Knight engine and all in the high priced category.

Nagant and Metallurgique are producing single models of 122 cu. in. piston displacement, output averaging about 1000 a year. Excelsior has one very high grade six-cylinder model with a still lower production. Imperia is in production on a small popular car with a single sleeve engine, but this has not been able to compete commercially with the low priced imported cars.

During the first nine months of this year America headed the list of imports into Belgium with a value of 157,259,432 francs. Second place was held by France with a value of 115,158,206 francs. The number of automobiles in use in Belgium is 87,000.

Balloon Tire Output Increases in October

Figures of Rubber Association Show a Gain Over September Shipments

NEW YORK, Dec. 17—Shipments of balloon casings and tubes increased during October, as compared with the previous month, according to statistics compiled by the Rubber Association of America, while those of high pressure tubes and casings declined.

The following statistics show the inventory, production and shipments for 1924 and 1923, the statistics for high pressure inner tubes being based on reports from 54 companies and those of high pressure pneumatic casings—cord on those from 56 companies:

HIGH PRESSURE INNER TUBES

	Inventory	Production	Shipments
1923			
Jan.	5,838,310	3,951,885	3,818,131
Feb.	6,771,958	4,039,202	3,063,883
March	7,740,945	4,875,414	3,910,562
April	8,394,184	4,259,558	3,618,495
May	9,292,223	4,317,537	3,488,394
June	8,924,326	3,590,011	3,661,527
July	7,527,281	2,666,354	4,030,253
Aug.	6,950,578	3,577,922	4,350,329
Sept.	6,457,455	3,254,575	3,724,724
Oct.	6,898,425	3,855,244	3,635,856
Nov.	6,693,639	3,451,716	3,453,083
Dec.	6,318,446	3,288,665	3,548,704
1924			
Jan.	6,720,247	3,887,959	3,542,500
Feb.	7,339,307	4,067,631	3,397,668
March	8,054,331	4,062,046	3,412,372
April	8,373,523	3,745,870	3,429,394
May	8,296,177	3,276,660	3,435,021
June	7,476,962	3,057,152	3,705,059
July	5,925,924	3,545,956	5,084,015
Aug.	5,006,578	4,583,385	5,250,579
Sept.	5,153,778	5,039,594	4,823,039
Oct.	6,464,783	5,466,553	3,872,813

BALLOON INNER TUBES

1924			
March	103,373	156,904	87,733
April	253,820	289,372	156,885
May	465,635	467,448	213,469
June	689,196	436,279	259,550
July	708,098	311,333	308,238
Aug.	751,732	427,302	369,335
Sept.	885,090	466,848	357,765
Oct.	887,417	429,244	402,103

HIGH PRESSURE PNEUMATIC CASINGS—CORD

	Inventory	Production	Shipments
1923			
Jan.	2,484,528	1,608,889	1,546,859
Feb.	2,816,382	1,763,763	1,426,161
March	3,117,662	2,198,643	1,924,670
April	3,382,375	2,086,617	1,804,072
May	3,935,828	2,187,442	1,631,474
June	4,096,145	1,772,512	1,346,673
July	4,108,853	1,173,142	1,315,664
Aug.	4,026,140	1,389,703	1,532,419
Sept.	3,733,734	1,169,140	1,457,778
Oct.	3,442,061	1,318,837	1,588,932
Nov.	3,237,315	1,369,117	1,544,986
Dec.	2,934,772	1,450,957	1,686,758
1924			
Jan.	3,196,362	1,941,314	1,735,035
Feb.	3,465,830	2,075,459	1,849,069
March	3,727,331	2,027,944	1,822,292
April	3,782,881	1,878,529	1,836,147
May	3,727,795	1,650,366	1,649,812
June	3,567,635	1,530,872	1,683,898
July	3,028,785	1,632,380	2,148,581
Aug.	2,679,205	1,983,530	2,663,087
Sept.	2,731,376	2,077,359	1,959,306
Oct.	3,279,383	2,276,134	1,779,232

BALLOON CASINGS

1924			
March	116,433	216,808	141,272
April	293,406	406,807	235,217
May	569,624	564,030	282,596
June	734,649	500,130	317,215
July	715,844	365,213	393,132
Aug.	765,002	501,166	435,572
Sept.	850,430	479,755	398,324
Oct.	899,824	485,371	454,117

PNEUMATIC CASINGS—FABRIC

	Inventory	Production	Shipments
1923			
Jan.	2,211,440	1,518,381	1,538,814
Feb.	2,408,005	1,454,224	1,249,468
March	2,552,939	1,667,083	1,502,822
April	2,705,897	1,452,709	1,275,671
May	2,970,766	1,472,544	1,212,969
June	2,944,455	1,184,431	1,229,324
July	2,362,271	819,847	1,281,821
Aug.	2,032,247	966,212	1,319,615
Sept.	1,663,823	860,441	1,214,777
Oct.	1,434,291	1,042,503	1,276,975
Nov.	1,452,014	1,030,608	1,011,215
Dec.	1,394,528	986,191	973,570
1924			
Jan.	1,611,722	1,278,978	1,103,535
Feb.	1,799,303	1,203,215	1,017,557
March	1,919,320	1,183,040	1,027,338
April	2,087,939	1,022,142	942,077
May	2,033,774	824,190	837,562
June	1,853,253	598,740	752,030
July	1,393,845	554,736	1,019,397
Aug.	1,032,809	750,045	1,094,455
Sept.	942,599	973,764	1,046,609
Oct.	1,159,173	1,115,571	913,412

SOLID AND CUSHION TIRES

1923			
Jan.	262,462	83,343	65,711
Feb.	270,191	75,457	67,084
March	265,843	79,788	82,405
April	260,631	71,468	76,204
May	268,323	77,288	71,114
June	283,425	72,445	56,170
July	263,891	42,345	49,126
Aug.	262,810	48,141	48,718
Sept.	249,379	37,074	49,667
Oct.	234,945	37,285	51,604
Nov.	213,686	32,577	53,178
Dec.	178,088	34,937	65,143
1924			
Jan.	182,782	53,604	47,295
Feb.	188,519	60,646	52,965
March	203,608	68,662	61,482
April	212,419	69,534	58,486
May	219,538	63,901	60,267
June	212,704	50,887	58,716
July	202,850	42,498	51,449
Aug.	183,159	52,516	60,684
Sept.	179,927	54,106	59,581
Oct.	182,400	58,938	58,078

INDUSTRIAL NOTES

Elk Manufacturing Co. is building a modern brick and concrete factory in Los Angeles for the manufacture of commercial truck bodies and also special bodies for Ford and Chevrolet chassis. The company was organized in November, 1922. Operations were started immediately on a small scale. Early in 1924 the company moved to new quarters, which it has now outgrown. The president is Fred E. Johnston, who formerly manufactured automobile and truck bodies in Fort Smith, Ark.

Hart-Parr Co., Charles City, Iowa, has been granted a license in Wisconsin. It has established an office, sales and service station in Fond duc Lac under the management of H. P. Rhyner, formerly treasurer of the Wisconsin Tractor Sales Co., which represented the Hart-Parr. Of its authorized capital of $1,510,000, the Wisconsin division is allotted $20,000, according to the application for a local license.

Gibb Instrument Co. of Bay City, Mich., has changed its name to the Gibb Welding Machines Co. It is announced that this is a change in name only and denotes no change in organization. As the company no longer makes instruments, but is engaged exclusively in manufacture of electric welding and heating machines, the new name was adopted as being more accurately descriptive of the production.

Parrish Manufacturing Corp., manufacturer of pressed steel automobile frames, has awarded a contract for the erection of a new plant at Reading, Pa. When work is completed the company will transfer its operations from its present location in the Reading railroad's former shops.

Link-Belt Co. has moved its St. Louis branch office from 705 Olive Street to larger and more conveniently located offices at 36-38 Olive Street.

NEW FORD POWER PLANT

PITTSBURGH, Dec. 15 — Officials of the Ford Glass Works Co. announce that Henry Ford will erect a new power plant in Glassmere, near this city, to cost $1,500,000. A model "Ford town" is being built there to meet Mr. Ford's ideas of proper living quarters for his employees.

METAL MARKETS

A few weeks ago steel producers were looking forward to the holiday period with the feeling that it would afford an excuse for a week's shutdown without attracting attention to the light amount of orders on hand. All this has changed. Not only are orders on hand more than sufficient to keep mills operating at the year's best rate over the two weeks that are left of the old year, but none of the producers have to worry very much about a sufficient quota of orders for January output.

A very gratifying amount of orders for sheets is coming to producers. Last month's buying consisted chiefly of the heavy-rolled products, such as bars and shapes, and wire products.

Although automotive demand is still in the twilight zone, quite a little material is being bought and more is being negotiated for. On the whole, the market is firm. Hot-rolled strip is in good demand, with 2.40 and 2.60c., Pittsburgh, quoted.

Somewhat lighter is the inquiry for cold-rolled strip steel, but the price for that description is steady at 4.15c. Rollers of full-finished automobile sheets are disposed to pass up orders from buyers whom they know to be too exacting in point of quality.

Pending developments that will make it clear whether the demand is such as to justify upward revision of prices, producers are taking advantage of the changed conditions to the extent of giving preference to attractive specifications and the more easily satisfied buyers.

While the semi-finished steel market has, of course, gained considerable strength, sheet bars have not yet come in for the advance which non-integrated rollers of automobile sheets apprehend. The market is now $37, with $38 asked by one or two mills.

Most sheet-rollers are protected by contracts on their first quarter requirements. The industry, as a whole, is now working at four-fifths of capacity, but the Mahoning Valley sheet mills are reported to be running at very close to full capacity.

Pittsburgh makers of bolts and nuts have advanced prices about 10 per cent, and good-sized first quarter orders have been placed.

Chicago has followed the lead of Pittsburgh in a $2 per ton advance on cold-finished bars.

Pig Iron—Foundry iron rules firm at $21, valley, with some blast furnace interests asking up to $22. Considering the heavy buying movement of last month and the rapid approach of the inventory period, the interest shown by consumers, although somewhat less keen than a few weeks ago, is still remarkable.

Aluminum—The feeling persists in the trade that the sole domestic producer may at any time revise prices upward. This is based on the impression that the business booked of late has been considerable in extent and, having the field to itself, the domestic company only waited for an improvement in the copper market before it would readjust its price list. Aluminum has to compete with copper in the electrical field. Sellers of foreign metal have virtually no metal to offer at this time. What would happen if prices were to advance remains to be seen. Perhaps some of the European producers are building up a reserve with that possibility in view.

Copper—The market has reached the year's high, and seems well over the hurdles. Demand for automotive brasses is fair.

SMITH BOOKINGS FOR 1925 GAIN

MILWAUKEE, Dec. 17—On the basis of new business booked and inquiries being received so far in December, the prediction is freely made by executives of the A. O. Smith Corp., maker of pressed steel frames and automotive forgings, that 1925 business will show a material increase over 1924. A conservative estimate is a 20 per cent increase, it was stated. Business has been improving steadily since August, after declining from the late part of April, and impetus has been especially noticeable since the middle of November.

Calendar

SHOWS

Jan. 2-10—New York, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Bronx Armory. Open to the public except on Jan. 2 and 3 which are trade days.

Jan. 17-24—Cleveland, Annual Automobile Show.

Jan. 23-31—Chicago, National Automobile Show, under the auspices of the National Automobile Chamber of Commerce, Coliseum and First Regiment Armory. Open to the public except on Jan. 23 and 24 which are trade days.

Jan. 25-31—Chicago Annual Automobile Salon.

Feb. 7-14—Kansas City, Mo., Annual Automobile Show.

Feb. 21-28—San Francisco, Pacific Annual Automobile Show.

March 7-14—Boston, Twenty-third Annual Automobile Show.

March 8-14—Vienna, Spring Fair.

March 20-29—Geneva, Switzerland, Second Swiss International Motor Exhibition.

April 1-17—Sydney, Australia, Royal Agricultural Show. Embraces automobile exhibits.

April 22-May 7—Melbourne, Australia, International Automobile Show, under the auspices of the Chamber of Automotive Industries, in conjunction with the Royal Automobile Club of Victoria.

June—Rio de Janeiro, Brazil, Rio Automobile Show, originally scheduled for October, 1924, but postponed for more extensive arrangements.

RACES

July 26—Paris, Montlhery Track, French Grand Prix.

CONVENTIONS

Jan. 5—New York, Convention under the auspices of the National Automobile Dealers Association, Hotel Commodore.

Jan. 5-9—Chicago, Road Show and Convention of the American Road Builders Association.

Jan. 26-29—Chicago, Eighth Annual Convention of the National Automobile Dealers Association, Hotel LaSalle.

June 22-27—Summer convention of the Automotive Equipment Association at the Broadmoor Hotel, Colorado Springs, Colo.

S. A. E. MEETINGS

Dec. 15—Cleveland Section, Development of Clutches, Ernest C. Wemp, Long Manufacturing Co., Old Colony Club, Hotel Cleveland.

Dec. 18—Metropolitan Section, Multiple Wheeled Vehicles, A. W. S. Herrington and A. F. Masury, Hotel Empire, New York City.

Jan. 15—Indiana Section. Lubrication and Crank Case Dilution, S. W. Sparrow of the U. S. Bureau of Standards.

Jan. 19—Cleveland Section, Preparation of Fuel Charges and Detonation, Arthur H. Denison, Weger Motor Co., Old Colony Club, Hotel Cleveland.

Jan. 20-23—S. A. E. Annual Meeting, Detroit.

Feb.—Indiana Section, Automobile Finishes.

Feb. 16—Cleveland Section, Electrical Instruments and Measuring of Chassis Tests by Means of Them, J. H. Hunt, General Motors Research Corp., Old Colony Club, Cleveland.

Mar.—Indiana Section Developments in Transmission.

Mar. 16—Cleveland Section, Road and Riding Ability, Harry Horning, Waukesha Motor Co., Old Colony Club. Hotel Cleveland.

Apr. 9—Indiana Section, Talk by F. E. Hunt, head of electrical division, General Motors Research Corp.

Hill Finishes First in Culver City Race

CULVER CITY, CAL., Dec. 15.—Although Bennett Hill, driving his car Sunday at an average speed of 126.9 miles an hour, won the 250-mile race under the auspices of the American Automobile Association, negotiating the distance in 1 hour, 58 minutes and 18 3/5 seconds, the result left the 1924 Automobile Association championship in the name of Jimmy Murphy, killed at Syracuse, N. Y. The contest brought to an end the year's competition for the national championship.

At the finish Harry Hartz was second, Tommy Milton third, Fred Comer fourth and William E. Shattuck fifth. Earl Cooper, the only driver in the race with a chance to win the championship, lost it when he dropped out at the end of the 17th lap on account of engine trouble.

Hill broke the 250-mile average made by Tommy Milton at Charlotte, N. C., last October. He and Milton made no stops. Even J. S. Wilkinson, the sixth place driver, shattered Milton's Charlotte record.

Hartz, in nosing out Milton for second place after having been forced to lose valuable seconds in the tire pits for a tire change, furnished the sensation of the race. Averaging 133 miles an hour with only 20 still to go, in the last quarter he squeezed past Milton. Previous to this burst of speed the race seemed to lie between Milton and Hill.

Ralph De Palma, veteran Italian driver, averaged 128.6 miles per hour for the first 50 miles, thus replacing Hartz's former world's record of 119.9 per hour, sustained for 50 miles at Charlotte last October.

AUSTRO-DAIMLER TO OPEN

WASHINGTON, Dec. 15—It is expected that the Austro-Daimler works, recently shut down on account of a shortage of orders, will shortly resume operations, a despatch from the commercial attache at Vienna to the Department of Commerce says, due to the receipt of several orders for export shipment amounting to 500 cars.

France Recaptures World's Airplane Speed Record

PARIS, Dec. 17—At a speed of 280 m.p.h. Adjutant Bonnet, French Army, recaptured the world's airplane speed record for France. The coveted honor had been held for over a year by Lieut. A. J. Williams of the U. S. Air Service, whose maximum speed of 266.6 m.p.h., was made on a Curtiss Navy racer biplane having a 530 hp. Curtiss motor.

Bonnet used a cantilever monoplane, built by Adolph Barnard, fitted with a 450 hp. Hispano Suiza engine, which last month won the French speed record. In order to capture the world's title, Bonnet removed a square meter of canvas from the wings, which gave him the additional 4 kilometers per hour necessary to break the American mark.

The flight was carried out under similar conditions as those in Dayton, the speed being checked over a three kilometer course, flown twice in each direction.

HOUSTON INVITES COOLIDGE

WASHINGTON, Dec. 17—A delegation of 25 men and women, representing the United States Good Roads Association, the Bankhead National Highway Association and the city of Houston, called on President Coolidge this week and extended an invitation to him to attend the annual meeting of the two associations, to be held in Houston, April 21-26, 1925. The delegation was headed by Director General J. A. Rountree, who represented the two associations.

1925 Grand Prix to Be Over Difficult Road

PARIS, Dec. 10 (*by mail*)—Next year's French Grand Prix 122 cu. in. 621-mile race, to be run on the new Montlhery track, 20 miles south of Paris, will combine the most difficult road conditions ever encountered in a big French race. A special road circuit is being built inside the race grounds, to be linked up with the present 1½ mile track, thus forming a circuit more than 7½ miles around, with 25 bends, of which 12 will be difficult and six will be either right angles or hairpins calling for all the skill of the drivers.

In planning this special set of roads the aim has been to get the greatest amount of variety in the shortest distance. Only one-half of the present track will be used. There will be one perfect straightway of a mile in length, a similar stretch 800 yards long, a couple of almost straight lengths each two miles long, a climb up the flank of a hill with an average gradient of 8 per cent and a short maximum length of 12 per cent.

All Spectators Must Pay

Roads, which will be either concrete or tar macadam, will have a minimum width of 33 ft. Where two roads run parallel there will be a neutral zone of 50 ft. between them. The present track is of concrete. The Montlhery track management claims that the entire set of roads will be finished by the middle of May, although the Grand Prix race will not be run until July 26. Work has already begun, 3500 laborers, mostly Italians, being on the job.

For the first time in French history an automobile race will be run on other than public highways. As a consequence all spectators will have to pay for admission to the Grand Prix. A wall 8 ft. high and 10 miles in circumference is being built around the track and race circuit.